The Builder.

VOL. XXXVI. No. 1870. SATURDAY, DECEMBER 7, 1

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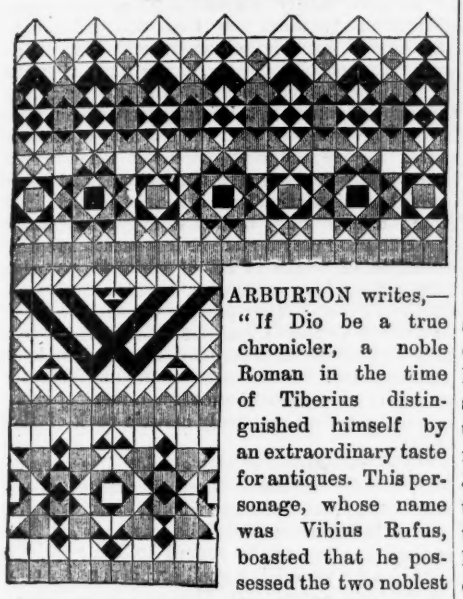
Suggestive Furniture.



ARBURTON writes,—"If Dio be a true chronicler, a noble Roman in the time of Tiberius distinguished himself by an extraordinary taste for antiques. This personage, whose name was Vibius Rufus, boasted that he possessed the two noblest pieces of antiquity in the world; one was Cicero's widow, Terentia, whom he had married in her third widowhood, and who had arrived at the mature age of a hundred years; the other was the chair in which Cæsar was assassinated." Our readers will be ready to believe that we sympathise with this noble Roman in his taste, at least so far as the chair is concerned, and may remember that not long ago we took the liberty of placing before them representations of part of a collection, which we have gradually accumulated, of specimens of that article of furniture which had been the accustomed seats of distinguished individuals,—those of Gay, Theodore Hook, Bulwer-Lytton, and Shakspeare.* The account of these brought some amusing comments. One of our best and best-known novelists gave strong evidence as to their interest by saying, "Never ask me into your room of chairs: I should see all the men sitting in them!" The eminent author of "Palm Leaves" wrote, "We have often heard of talking tables; these are in truth speaking chairs," and an enthusiastic citizen of the United States, through Messrs. Trübner & Co., offered anything that might be named for the chair that had belonged to Shakspeare!

On the occasion of that first notice we promised to illustrate some of the many similar memorials in our hands, and having been good-naturedly reproached from a number of quarters at a number of times for not doing so, we now willingly supply the omission, and give a view of Lord Byron in the midst of a chat with Anna Bullen, Mrs. Siddons, and Lady Morgan. At any rate, it requires no very strong imagination to produce the picture, for here are the veritable chairs they habitually occupied.†

The fire-screen behind, let us say at starting, belonged to Dr. Johnson. It came to us from Dr. Hugh Diamond, F.S.A., and we will let him tell the history of it. "For some twenty years or more," says the Doctor, "I attended old Mr. William Walker, who kept Walker's Hotel, Dean-street, Soho, before called 'Jack's Coffee House.' [It was so named after John Roberts, one of the singers at Garrick's, Drury-lane.] A well-known club was held there. The screen was a portion of the furniture of the club-room. One day I was talking to Mr. Walker, as I often did, on the former state of the parish, and he said, 'When my uncle came here and I was a boy, none but nobility and gentry lived in the street, everybody kept his carriage, and some drove six horses. The gentleman that lived in Dr. Carpue's house, at the corner of Meard's-street, had six of the most beautiful black horses that were ever seen! But there was one man here who was a great blackguard, Mr. Jesse Foot, the surgeon.' My old instructor, Mr. Abernethy," adds Dr. Diamond, "used to speak of Jesse Foot as the jackass that kicked the dead lion, John Hunter, which excited me to ask about him. Walker told me he was 'that vulgar' that he would draw the table up to the fire, sit on the corner of it, and once took Dr. Johnson's fire-screen to prevent his knees being burnt. Asking him respecting Dr. Johnson's fire-screen, he told me it was brought from Dr. Johnson's house in the City by a member of the club, and given to his uncle for the club-room. His uncle told Jesse Foot, 'he valued that screen more than he did Foot's custom, and he would not have it destroyed'; and he said a great deal more about it which I need not repeat. I rather think it is engraved in Prior's 'Life of Goldsmith'; at any rate, Fairholt once showed me a woodcut containing it. I consider its authenticity beyond dispute. In 1858 Peter Cunningham asked me for the screen, and I should have given it to him but for an accident. Alas, poor Peter!"

And now as to the chairs. Anna Bullen's came out of Hever Castle about forty years ago; it was sold by the then owner when renovating, to make room for modern furniture all glare and glitter. It is of oak; the legs are fluted Doric columns. The front of the seat, which, by the way, is very low, is ornamented with a coarse sort of marquetry or *tarsiatura*. If made in this country it is probably one of the oldest English secular chairs to be found here. The Italians had improved in this sort of furniture so much in the sixteenth century that, as Labarte mentions, "Foreign princes ordered it from Italy." We may imagine, and without much fear of being wrong, that Anna Bullen, poor lady, often sat in it while King Henry VIII. made love to her.

The next to Anna Bullen's in the print was the favourite chair used by our great actress, Mrs. Siddons, when studying her theatrical characters at home, and is the identical one specially taken on many occasions to the theatre or her use upon the stage, particularly in the character of *Queen Katharine*. It was left with her furniture, wines, and the celebrated picture of the Kemble family by Harlow, to Miss Wilkinson, her companion and confidential friend, who lived with Mrs. Siddons many years, and up to the time of her death. Miss Wilkinson was the sister of the well-known Tate Wilkinson, the manager and owner of the York and Hull theatres, and Miss Wilkinson gave the chair, soon after the death of Mrs. Siddons, to the late Dr. Thomas Stevenson, F.S.A., from whom we had it. Dr. Stevenson said in the letter which accompanied it,—"As I dare say you know, Mrs. Siddons lived and died in her house at the top of Baker-street, near to the Regent's Park-gate, and was buried in St. John's Wood church. Miss Wilkinson died under my care a few years after Mrs. Siddons, and was laid either in the same vault or close to it. The picture by Harlow was given to the Kemble family."

The chair is made of bamboo, with cane bottom; very light, and the seat is as low as Anna Bullen's, 13 in. from the ground.

Sydney Owenson, after writing "The Wild Irish Girl," came into Fashion, and later on, when married to Sir Charles Morgan, became one of the queens of society. Her throne-like chair, velvet and gilt, precisely befits her memory: it always held the lady while she held her court. After the death of Lady Morgan, in 1859, it came into the possession of our much-esteemed friend, Mrs. S. C. Hall, to whom we are indebted for it. For how much pleasure and profit others are indebted to Mrs. Hall it would be impertinent to estimate here.

A niece of Lady Morgan, Sydney too, carries on the traditions of her *spirituelle* aunt, and gathers around her, in a bandbox of a house in Sloane-street, more clever men and women than are often to be found in larger rooms.

The story connected with the Byron chair is an odd one, and we are disposed to tell it as it was told to us by the former owner of the chair, the widow of one of our consuls, who served both in Europe and America.

In 1835, a gentleman distinguished as an associate of the Byron coterie of elegant men resided in Ostend. His name was Scrope Davies. He had been obliged to form a home on the smallest pittance. If asked, "*Who* was Scrope Davies?" the reply would be, "A gentleman with a university 'brevet.'" If asked *what* he was,—"*A wit.*" If, again, asked his profession, it might be added, "To be good company." Every town in Flanders possesses one or more squares where soldiers are formed for drill, and where markets are held twice a week. In such a square, over an entrance into a yard, was an apartment which had been a hayloft, to reach which a ladder was fixed to the ground with a ramp on both sides. Here Scrope Davies made his home. He had filled two rooms fashioned in the loft with relics from all the distinguished men he had known, and was visited by many eminent people as they passed Ostend to pay their respects to King Leopold at Brussels.

* See pp. 325, 327, *ante*.

† See p. 1279.

When at Brussels himself Davies was honoured and fêted. In Ostend no dinner was given by the best English families without him, and when he entered the *salon* the host felt that the chief attraction of the party had arrived. Our hero of the loft had created for himself oddities which added to his great personal interest. The father of the lady who tells the story knew how to appreciate Davies, who, in return, invited him to the loft, where he found innumerable objects of interest. He was able, too, to serve Davies. This sympathy led to the gentleman one day carrying down the ladder the high-backed, old-fashioned chair made of oak-wood and crimson velvet, shown in the engraving. The four feet represent those of a cloven-footed animal. This chair came from Byron's ancestral mansion, where he used it in his library. Davies was of middle height, well proportioned, stooping slightly; for he was sliding down in years and strength. His features showed no change of expression while causing the greatest hilarity in others. His memory must have been prodigious!

Let us retrace his morning's occupation on a day when he would win all suffrages both during and after dinner. The families in Ostend contrived to give their parties on the market-days, for obvious reasons; and on those days every cook in the town was at the market dressed in her most picturesque habiliments. Scrope Davies comes upon the ground, and a general buzz ensues among the market-women. Some run up to him with poultry, others with fruit. Those who do not leave their seats scream and clap their hands to attract his notice. What is he stopping for and looking after? He dines to-day at the British consul's. He is looking after the consul's cook. Here she comes. Scrope smiles and follows her. "Well! what do you intend to buy?" (Speaking in French.) "What does monsieur recommend?" She follows him to a stand of poultry, where he points out the very best specimen, and, after a little parley, she makes the purchase he recommends. He acts in a similar way with all that is to be had. It was not wonderful that the market-women tried to propitiate him. Our lady informant, whose name we withhold simply because we have not her leave to publish it, adds,—"My father left me his relic, which he prized greatly. Since his death I have held it with care and reverence. It came into our possession about 1835. Alas! it is become infirm, though otherwise in good condition, and kept together by a slight band of metal, which is not visible. I heard of Davies when at Paris, and wrote to him, but he was unable to leave his bed. He died soon after, but I never heard the exact date of his death." Readers of Moore's "Life of Byron" will remember several entries wherein the name of Scrope Davies appears, and will grieve that a career which began so well should have ended so ignobly. Byron, who used to address him, "My dearest Davies," says in his journal, "One of the cleverest men I ever knew in conversation was Scrope Berdmore Davies." "Scrope was always ready and often witty"; and under date March 28th, 1814, appears this note,—"Paid Scrope Davies 4,800*l.*, a debt of some standing, and which I wished to have paid before." We recall one reply by Davies, which may serve to prove his readiness. BeauBrummell, when about to retire to France, obtained a grammar to study; and some one afterwards asking Scrope Davis what progress Brummell had made in French, he replied, that "Brummell had been stopped, like Bonaparte in Russia, by the elements." However we have nothing to do with Davies, excepting as the previous owner of Byron's chair, and we have said enough to show how it was that Byron gave it to him. Davies's appears to have been a wasted life, not without its moral, but we must trace it no further or we shall have our readers mentally calling us to order with the accustomed "Chair! chair!"

Ancient and Modern Views of London. At the suggestion of the authorities of the South Kensington Museum, Mr. J. G. Crace has deposited with them a considerable part of his remarkable collection of maps, plans, and views of London. They have been arranged in the West Galleries, where the Caxton Exhibition was held, and will be open to the public about Christmas; but as Mr. Crace is about to leave England for a time, a private view will be given on Tuesday next.

"ABOUT ETCHING."

The above laconic title forms the general heading of the *catalogue raisonnée* which Mr. Seymour Haden has compiled to accompany and illustrate the collection of etchings which he has lent for exhibition at the Fine-Art Society's Gallery in New Bond-street. The collection comprises a large number of exceptionally fine impressions of etchings by old masters, and a selection from those executed by Mr. Haden himself. Before commenting on some of the works themselves, we may bestow some notice on the remarks in regard to the art of etching, which are incorporated in the catalogue, or rather form an introduction to it.

When an artist or an amateur (whichever Mr. Haden prefers to be called) has made a decided success in any special branch of art, it is a matter of interest to know something of the light in which he regards it from his own point of view, and in this respect the pamphlet before us presents some suggestions decidedly original and independent. In the first place, the practical reason which induced the author to take up etching is stated to be his conviction that the cultivation of accuracy of observation and delicacy of hand attained by drawing or modelling from nature is of the greatest assistance in the profession of a surgeon, and he quotes his own recommendation on this point in a report upon appliances of modern surgery in connexion with the International Exhibition of 1862. This, we venture to think, must be taken *cum grano:* not that we have any doubt that Mr. Haden is speaking in good faith, but we surmise that the real fact is that he had a great natural artistic faculty and inclination, and that he has half-involuntarily excused himself to himself for what might seem a neglect of his profession, by seeing in his artistic work a means of supplementing professional training. We are very glad he finds it so, but we should look with some doubt on the idea of persuading surgical students or practitioners generally that it is good for them to etch or to sketch, whether they feel any impulse or talent for it or not. The idea is, in fact, in opposition to the very first sentence in the next section (Note III.), embodying Mr. Haden's own ideas on art in the shape of a letter which was published in the *Gazette des Beaux Arts*, in which he says, and truly, that "artistic faculties are innate and cannot be acquired: art is a moral and intellectual emanation which study may develope, but cannot create." There are other remarks in this letter which are of interest, and we notice that the writer expresses the opinion, not very popular at present, that technical superiority and minuteness of finish are of secondary importance in art:—"L'artiste doit se rendre maître du procédé au point de donner une belle forme à sa pensée. Qu'aille trop loin, et les moyens deviendront le but; les sentiments et la pensée, au lieu de dominer, seraient emportés par la facilité. Je ne fais aucun cas non plus d'un travail trop minutieux. L'élaboration d'un détail absorbe du temps. Dépenser trop de temps sur un tableau, c'est affaiblir sa conception," &c.; and Mr. Haden observes, in the course of the same letter, that he has always found that those of his own etchings that were not finished in one day seemed to want force and harmony. There are, however, two sides to this, as we shall have occasion to notice.

But what strikes us as of most interest in the ideas which are thrown out in Mr. Haden's notes, is the contrast which he draws between etching and engraving, and the relative value and capabilities of the two methods. We could wish that these remarks should be generally read beyond the circle of the comparatively limited number of persons who will purchase this catalogue. He points out first the distinction between the engraver as he is now generally known, the translator of the work of the painter into a form fitted for mechanical reproduction, and the class of engravers in the fifteenth century who were themselves painters of eminence and of genius, and reproduced their own works, with their own feeling and individuality of handling, by means of the graver, which they were content to use as the only tool of the kind known to them. "But the moment the possibility of acting upon the plate by an implement used like a pencil was shown to them, the burin fell from their hands and they became etchers, while the graver descended at once to a class of men who thenceforth undertook, by a slow and laborious process to which the instrument was not ill-adapted, to reproduce the works of the others," and who "proceeded at once to show how tones might be rendered by lozenge-shaped intervals with or without a dot in the centre of each, the bursting rain-cloud, by an arrangement of consecutive curves not unlike the engine-turning at the back of a modern watch, atmospheric backgrounds by a sort of tooling, having something of the effect of watered silk, and skies by a machine." The etching-needle is to the burin as the pen to the plough; and to illustrate "what infinite memoranda may be made by the point of the etching-needle while the burin is delving its conventional and inexpressive furrow," the author bids us consider Rembrandt's little portrait of his mother, a drawing about 2 in. square, and observe the extreme delicacy of the indications of anatomy and facial character made by such slight means in this consummate little work of art. That is the real distinction of value between etching and imitative engraving, which the general public have hardly a notion of at present,—the distinction between the free and individual handling of an original artist and that of a workman methodically producing a given effect by semi-mechanical means. The other side of the subject must not be forgotten, of course; it must be admitted that the capacity of etched plates for reproducing copies is much more limited, and depends on a much slower and more careful manipulation than is required in printing from an engraving, and that engravings have furnished to many a more or less passable representation of works of art of which they would have got no idea otherwise, because no reproductions by any other process would have been accessible to them; and for this let engraving have due credit, as a populariser of art up to a certain point. But the most minute and laboured works of this kind cannot for a moment rival in value the free and truly artistic work of the etcher.

"The properties of the etching line are, in fact, wholly mental,—those of the engraved line wholly, or almost wholly, mechanical." And this sentence gives the cue to what the author has to say in regard to the requisite faculties for producing good etching; and while we entirely agree with him, and have before expressed the opinion, that the true object in etching should be not high finish, but effect and expression produced by few lines, and that this theory of the art presupposes that there should be thought in every line, and that the etcher should know exactly what to include and what to leave out in order to produce his result, we nevertheless fail to see that this consideration leads to the conclusion that etching is essentially the form of art least of all suited to the amateur. As Mr. Haden works himself as an amateur, his persistency on this point is a little curious. There are, of course, amateurs and amateurs; but we are here considering the term as indicating a man of true artistic feeling, but not practising art as a profession, and not able to give up very much time to it. Now in this light it appears to us that the very qualities which Mr. Haden quotes as characteristic of the best etching, the very nature of its requirements, the fact that it demands no laborious manipulation, but does demand feeling and insight into the relations between nature and art, are exactly what make the art peculiarly suitable to the class of amateur whom we have mentioned, and who alone is worthy the name in its best sense. A man may have much natural artistic insight, and not a little artistic cultivation of mind and hand, yet have no time to master the technique of oil or water-colour painting. Etching presents him with a means of artistic expression which calls into play and demands the very mental qualities which we are supposing him to possess, but does not demand the time and the laborious manipulation which circumstances would prevent him from bestowing. True, that he must have the real spirit of an artist, or he will throw away the capabilities of his method by misusing it in a wrong and inartistic manner; but the very fact on which Mr. Haden insists, that the value of the etched line is really mental, and depends on the thought that goes into each touch, is exactly what is in favour of the amateur succeeding in producing a real work of art by this means better than by any other. The mental qualities he may possess, often does possess, to a marked degree; and etching affords him the means of making the best of them by a process which does not tax him disproportionately in regard to

time and labour,—in which the mental perception has higher value in proportion to manipulation than in any other form of artistic expression.

A few words now as to the nature of the very valuable and beautiful exhibition for which we are indebted to the liberality of Mr. Haden. To say all that might be said in regard to such a collection would occupy far more space than we could suitably bestow upon it: a few remarks upon its leading features must suffice. The etchings which are the work of "old masters" afford illustrations of nearly every variety of style and feeling except that which is peculiar to modern work, and of which Mr. Haden's own etchings afford brilliant examples. We can travel from the precise, minute, and realistic work of Hollar to the opposite extreme of imaginative power and freedom of handling in some of the most powerful productions of Rembrandt. One of the first things that strike us, however, is not an etching, but an engraving by Beham (portrait of the Emperor Charles V.), placed among the etchings in a spirit of impartiality, as exhibiting a triumph of expression and execution with the burin, and representing what we may take as the finest type of work which this instrument can produce in the hands of an original artist. Mr. Haden regards this also, and with good reason, as an interesting illustration of the attempt to escape from the comparative hardness and stiffness of the continuous engraved line by breaking and interrupting the lines, in a manner scarcely noticeable without very close examination, but sufficing to give a considerable softness of effect, more approaching to that of etching. In curious contrast to this are hung two works by Abraham Bosse, in which the endeavour has been to impart to etching the look of engraving, by the careful and laborious use of parallel shading lines by which the compositions (representing the interiors of a studio and a printing-room) are almost entirely modelled: not probably with the actual intention of imitating engraving, but because the practical mind of the worthy Abraham Bosse valued neatness before anything else. Except as curiosities, these works are of little value. Some works by Both and Canaletto are of interest as showing these artists through a different medium from that by which they are generally known: Both's work with the needle is fine and sympathetic; that of Canaletto we can find little admiration for, it is niggled and mechanical, and wanting in tone. Several Claude etchings that are near these are beautiful in their combined freedom, finish, and aërial effect, and the comparison of this work with his paintings cannot but raise our ideas as to the genius of the artist and the extent of his capabilities. In regard to Claude we are considerably interested by the suggestion made by Mr. Haden about the *Liber Veritatis*, to the effect that these famous and over-praised drawings were really meant as "pictorial memoranda" of the pictures which the artist had painted and the persons for whom they were painted, in order to defeat the impostures of his contemporary imitators. Mr. Haden has the boldness to say that it is a mistake to suppose that they are very precious in an art point of view; and those who think most of Claude will be most likely to agree with him. The soft landscape beauty of the Claude etchings, however, affords an almost tame enjoyment in comparison with that produced by the strong hand and over-mastering genius of Albert Dürer, in whose work we have the extraordinary combination of the most precise and hard finish with the wildest and most romantic feeling. It is unnecessary to say anything of these well-known works, except that some of the impressions here shown are peculiarly fine. Very interesting also it is to see some of the portrait etchings by Vandyke, in which the painter was to execute the head and other inferior artists to finish the work of adding background and accessories; it is needless to say that great value attaches to impressions taken before these additions were made, some of which are to be seen here.

Hollar is largely represented, and in despite of the absolutely prosaic turn of his art, interests one in the highest degree by his extraordinary and varied executive power and the thorough honesty of his art. His drawing of Antwerp Cathedral is a wonderful piece of solid and patiently accurate execution, yet remarkably deficient in regard to any feeling for the poetry of architecture. Yet when we turn from this to the little etching of "an English lady in a winter dress," the figure scarcely more than 2 in. high, and contemplate the minute delicacy of shading and modelling combined with really broad and forcible effect which this little work illustrates, we must form the very highest idea of Hollar's power of doing what he liked with his materials, and of being, when he chose, realistic without hardness. In his views of buildings the desire for rigid topographical accuracy appears to have stood in the way of artistic effect with him: this, of course, gives them a remarkable value as pictorial records; but the poetic element is at a minimum in his work, if it can be said to exist at all, and we certainly cannot, like Mr. Haden, see "everything" in Hollar, except in regard to mere technique. Nor can we share his enthusiasm about Karl du Jardin in the sense in which he expresses it; what strikes us, at all events, in the works exhibited here is not so much the tranquil or "tranquillising" feeling of which Mr. Haden speaks, as the supremely able drawing in such a work as "The Two Horses"; the animal lying down and foreshortened is a masterpiece: even Paul Potter's "Chevaux de Charrue," of which there is an impression on the opposite wall, must yield to this.

Of the etchings of Ostade and those of Rembrandt which are exhibited, it is hardly possible to speak here, because one feels that one must say so much if one says anything. The Ostades are only seven in number, but they are examples of perfect balance in composition and manipulation which it would be difficult to match from any other hand. In mentioning them in the same sentence with Rembrandt, however, we by no means intend to imply any possibility of comparison between these works of consummate art, but restricted subject and feeling, and the great world of Rembrandt's art. Forty of the etchings of Rembrandt are placed here, and the contemplation of them fills one with a sort of wonder. There may be no single work with precisely the balance of style of Ostade, for the well-known "Burgomaster Six" is *over*-finished, and so unlike the usual aim of Rembrandt that Mr. Haden suggests that it was a special treatment adopted by the artist to please his friend the sitter. But if we look from one to another of the works in which Rembrandt was expressing that which was really and inherently characteristic of his genius, the expression employed above does not appear too large: his productions fill a whole world of feeling in themselves. Looking at the delicacy of such works as his little portrait of himself (the head only) with a fur cap, and the portrait of his mother before mentioned; then at the curiously chivalresque and cavalier style of the better-known half-length of himself, with cloak and feathered hat, in which he almost seems to have beaten Rubens on his own ground; then at the rich sensuous fulness and ripeness of execution and feeling in that portrait of his wife Saskia, evidently executed in every sense *con amore*; and then pass to the tenderly pathetic sketch of "The dying Saskia"; and then come on a landscape ("The Three Trees") which even Turner has never surpassed,—and so on, through the list, we feel a sort of awe before the power and pathos of this marvellous self-educated genius, the culmination of whose power is fitly shown in that tremendous etching of "The Crucifixion,"—a thing which it is impossible to analyse, but which we feel is above all rules and criticisms of art, which Rembrandt only dared have done, and which no one after him could imitate with any chance of success.

Among the remaining etchings by deceased masters, there are none to be mentioned after Rembrandt's which can seem, in comparison, of any artistic importance; it is of interest to find two slight sketches by Wilkie in this medium, and one by Turner, an outline sketch of no great importance, however. Let us, in conclusion, look at the etchings by the exhibitor himself, which are in a separate apartment. Some few of these we have noticed before in another exhibition. There are eighty exhibited, and a very remarkable collection they are. Mr. Haden does not go largely into figure subjects, and hence is fortunately out of the way of direct comparison with many of the greatest works in the adjoining room. One figure sketch, however, called "The Assignation," a young woman about, shyly, and with downcast face, to enter the door she has just opened, is very sweet and graceful, and has much delicacy of execution. It is by landscape etching, however, that Mr. Haden will be estimated, and here it may be said that he has no need to be afraid of his company, and that in some of the highest qualities of the art he may stand in competition with almost anything that has been done in etching. There may not be any such subtle union of the qualities of painting and of etching combined as is to be found in Claude's "Le Bouvier," but in the artistic use of the capabilities most peculiar to etching his best works are unsurpassed except by Rembrandt, and there is in them a feeling which is peculiarly modern, and gives them an interest different from that of old work of similar excellence. "Kidwelly Town," for example, is a drawing which could hardly have been made except by an artist of the present generation; it embodies a peculiar kind of picturesque melancholy difficult to define, but a good deal illustrated in some of our most recent landscape-painters and idyllists, as they may be called. "The breaking-up of the Agamemnon" is in a much grander and more serious vein, it is such a work as might be ascribed to Turner; and another near this, "a river in Ireland," strikes us as one of the finest, and exhibits a touch and style very different from most of the others. In a general way, however, it may be said that the variety and absence of mannerism in these works is very remarkable: we have hardly any repetition of subject, and the extent of ground covered with regard to style and handling between such works as "Kensington Gardens" and the dry-point study called the "Mouth of a Brook" is certainly wide enough to convince any one that the artist is no picture-maker by rule, but is able to seize the feeling and character of each scene in turn, and derives his inspiration direct from Nature. The amount of light which seems to flood some of the scenes, as in that called "Battersea Reach," is to be noted, and the means by which it is attained, rather by a judicious abstinence from touches than by any positive effort at contrast: this and some other works furnish apt illustrations of what Mr. Haden himself says as to the necessity of the etcher knowing both what to do and what to leave undone. If we want an effect of chiaroscuro of an opposite kind, however, we have it in a beautiful form in "Mytton Hall," where the picture is all dark with trees, which only allow narrow strips of light to escape across the walk, and the old house gleams in the background with that delicate tone, so far removed from the dead white of the lights in engraving, which only belongs to copper etching. We could say much more in sympathetic admiration of these fine works, but must now recommend our readers to go and look for themselves, and also not to fail to procure Mr. Haden's catalogue, and take note of some of his original and suggestive criticisms on the subject of the art which he illustrates so well.

SEWAGE AND IRRIGATION WORKS IN GERMANY.

THE question of sewage irrigation, after having been allowed to recede somewhat into the background for some time, is again attracting public attention to a more than ordinary degree. It is a subject which has repeatedly given rise to lively controversy in England. On that account a reference to what other countries have been doing, and are still doing, in the matter will be of interest. The steps taken in Germany with that view especially will throw additional light on the knotty point whether sewage irrigation "pays." Authorities at home disagree on the financial aspect of such undertakings, but it has been proved that better crops can be grown with sewage alone than could be grown under tillage costing sometimes as much as from 2*l.* to 3*l.* per acre. It has also been shown that if the sewage can be delivered upon land by gravitation close to the sewage works, this mode of disposing of it is more profitable, as well as more consonant with the objects of sewering towns, than discharging it into rivers at some distance below them. Others, again, will have it that the most economical plan to dispose of town sewage is to carry it, if possible, bodily far enough into the open sea that there is no chance of its being brought back again by the tide. Whichever system may be preferred, or whichever may be the most practicable under varying conditions, we think it will be sufficient to show that if irrigation by sewage tends to decrease the expense of removing it from towns, it will be the more economical as well as the safer way of disposing of it. As we have said, and we might cite numerous cases in this country confirmatory of our view, so much

has been proved. For this reason we need not dwell any longer on the question as it affects England, but proceed at once to examine its aspect in Germany. And here again it will not be uninteresting to note that the Germans have taken a leaf out of our book: that they are introducing, or have introduced, a system of sewerage into some of their larger cities at least, partly by the help of British engineering and British capital; which is eminently true in the case of Danzig, at one time one of the most unhealthy cities of the Continent, and a city the purifying of which was a far more Herculean task than the celebrated cleansing of the Augean stable.

Although the Danzig contract itself was based upon the extravagant reports prevalent in England (about 1865 to 1870) as to financial results of sewage farming, we have it upon the best authority that experience there is such that similar undertakings, if properly arranged and conducted, may be confidently recommended for safe and satisfactory investments. Indeed, the Danzig undertaking has turned out so well, as we shall presently be able to show, that the municipal authorities of another large city, viz., Breslau, formerly also notorious for its insalubrious condition, with a population of 270,000 souls, have recently concluded a contract with Messrs. J. & A. Aird & Mare, the eminent Berlin firm of engineers, who completed the Danzig works, and have been working the sewage farm there for some time, for laying out the land and undertaking the management of the works and farming for twelve years. Moreover, Berlin, with over a million inhabitants, after having for several years made a most exhaustive series of trials of all the known or projected systems, has finally adopted the irrigation system. The chief engineer of the Berlin municipality, Herr Baurath Hobrecht, states the total cost of the irrigation arrangements, including purchase of the land, buildings, cost of mains from the pumping stations, laying out the lands, roads, &c., to be 260 thalers per morgen, or about 60*l.* per acre, the morgen being about six-tenths of an acre. The Berlin authorities are completely satisfied with the financial results.

After this general preliminary statement, let us consider the case of Danzig; and as the supply of water is closely connected with the removal of sewage, indeed the latter could not be thought of without, a few remarks on that point will be necessary. The municipality of Danzig resolved as early as 1863 to provide the city with pure drinking-water, and a complete system of sewerage. The Danzig waterworks, if a system of wooden pipes liable to pollution from external causes may be called by that name, dated from the time of the German Knights. They only supplied water for general use, however, and drinking-water was brought into the city on wagons, and was sold at a high rate. However, with the opening of the new waterworks in 1869, by which pure water was brought a distance of about fifteen miles from reservoirs *circa* 350 ft. above sea level, all this was changed. The daily supply, since the day of their opening, has varied between 245,000 and 400,000 cubic feet. The total cost for executing all the works connected with the undertaking has been not quite 550,000 thalers (82,000*l.*).

The draining system of the city was so defective that it would have been extremely injudicious to discharge into it an increased quantity of used and polluted water. The highly dangerous accumulation of filth of all descriptions in houses and courts, street gutters and cesspools, as well as in the public water reservoirs, called for urgent reform, by introducing a new system of drainage. When, therefore, the question of water supply was once determined, the carrying out of drainage works could be seriously thought of. A contract was concluded with Messrs. Aird for executing them, and detailed plans, on the project as submitted by Herr Baurath Wiebe of Berlin, were prepared by Mr. Baldwin Latham, C.E. The works were begun in August, 1869, and completed by the end of 1871, at a cost of 700,000 thalers (105,000*l.*).

There remains to consider the more important part of our subject, the disposal of the sewage for irrigation purposes in Danzig. In the absence of a more conveniently situated and better site, the dune district on the coast of the Baltic between Weichselmünde and Heubude, the property of the city of Danzig, has been selected as the ground for purifying the sewage and utilising it for agricultural purposes. The land in question was partly covered with firs; about 200 morgens were let for pasturage, at the low rent of 50 thalers.

By the contract of September 13, 1869, Mr. A. Aird acquired the right to use the sewage of Danzig, as well as a grant of 2,000 morgens for irrigation and farming purposes, for a term of thirty years, for which Mr. Aird undertook, for a like period, to keep in perfect repair and working order all the sewers and drains and the pumping-station. The expenses for this undertaking of Mr. Aird's may be estimated at from 8,000 to 10,000 thalers (1,500*l.*) per annum. At the end of the term, Mr. Aird has to give up possession of the land, with all improvements and plant, without claiming compensation for the capital laid out in the cultivation of the land. Any buildings erected by him he may take down and remove, unless the city of Danzig choose to purchase the same at a valuation. The contract was a risky undertaking, yet, as will be shown by and by, Mr. Aird has rendered by it a great servive not only to Danzig but also to other German cities which have undertaken similar works.

The plant at the pumping-station includes two steam engines, each sixty horse-power, of which one is at work, as a rule, only from fourteen to eighteen hours a day. During heavy rains, and from May to September, one engine is always at work. In the former case, from 350,000 to 390,000 cubic feet, in the latter, from 525,000 to 550,000 cubic feet,—of which about 175,000 cubic feet are water let in from the river Mottlau, as then the sewage alone would not be sufficient,—are daily taken to the area of irrigation. The channel into which the delivery-pipe empties itself lies at the highest point of the dune, feeding from here all the principal irrigation trenches. The latter branch off on both slopes, and give off again into smaller channels. The ground is levelled in accordance with the gradient, the irrigation being effected according as it is wanted, either by damming up or through furrows. Should there be any surplus sewage, this flows into the sea.

A few words as to the nature of the ground. The dune district in question, it should be stated, is by its nature very little suited for agricultural purposes, and for purifying sewage. The sterility of the dune sand is still further increased by being impregnated nearly everywhere with a fine red sand, so-called *Fuchssand* (a kind of red garden gravel). The hilly configuration of the ground, moreover, made the works of levelling rather expensive, the cost of the area brought under cultivation being 11*l.* 5s. per morgen (15*l.* 15s. per acre), but will be much less in the future. In consequence of the capillarity of the sand, the level of the ground water is very high, and this increases the difficulty of draining. The growth of the shooting and young plants is not unfrequently jeopardised by sand-drifts.

Although dune sand at first permits sewage water to run through it more quickly than is desirable, its power of absorption is still great enough to allow of the development even in the first year of a luxurious vegetation of the most exacting plants. In consequence of the property inherent in roots of plants, not only of appropriating substances contained in solution in the ground water, but also of dissolving and absorbing matter coming into contact with the finest root-fibres, luxuriousness of vegetation contributes no less to purifying of sewage water than does the power of absorption of the soil. But the latter also steadily and speedily increases, consequent upon the rapidly progressing formation of humus, to which the organic substances suspended in sewage water, and being deposited in the sand, as well as the decomposing remains of vegetable substance produced, contribute equally largely.

The filtrated water, if it does not come into contact with the red sand, and is not coloured reddish by it, is quite clear, free from smell, and tasteless. The purifying process has been complete. The filtrated water has been tested in vain by chemical analysis for the complicated chemical elements of a urinary or fœcal nature. They have, as far as they have not been absorbed by the soil or assimilated by the roots of plants, experienced a lasting change of substance, and have been oxydised to carbonic acid, nitric acid, ulmic acid, butyric acid, &c., by the oxygen of the air contained in the soil and continually replaced.

Of the dune area intended for agricultural purposes, there were in cultivation, in 1872, 30 morgens; in 1873, 120 morgens; in 1874, 250 morgens. Those operations had to some extent the character of experiments, which were to form sound foundations for future cultivation. There not being a market for fresh-cut grass, and haymaking interfering with the development of the after-growth, the cultivation of grass is considerably confined, and that of beetroot, turnips, maize, oil-seeds, cereals, vegetables, also tobacco, carried on. In 1876, 500 morgens were levelled and prepared for cultivation, and tilled as follows:—90 morgens with beets, 34 morgens with colza, 60 morgens (on which that year for the first time oats were grown) with rape-seed, 50 morgens with buckwheat, 12 morgens with barley, 12 morgens with tobacco and maize, 15 morgens (on which rape-seed and flax had stood) with late turnips, 1½ morgen with hemp, 1 morgen with caraway-seed, 50 morgens with Timothy grass and clover (sown end of June and beginning of August), 5 morgens with vegetables; 170 morgens of freshly levelled land were reserved the same year (1876) for planting next spring with beets and other summer crops.

The irrigation, as already stated, was begun on a small scale in 1872, after, at the end of 1871, the sewerage system had been completed. A beginning was made, as in England, with Italian rye-grass. An area of eight morgens, first laid out, was sown on May 1 with rye-grass; the first cut was taken, on June 12, of a length of 18½ in.; the second, on July 5, of 19½ in.; the third, on July 30, of 20 in.; the fourth, on September 5, of 20½ in.; the fifth, on November 1, of 28½ in. The second area, of 6½ morgens, was sown on June 7, and gave four harvests,—on July 8, August 7, September 23, and November 3,—of similar lengths. The third area, of 4 morgens, was sown on August 14, and gave in October a cut of 24 in. long. In 1872 the grass grew at the rate of 1 in. in twenty-four hours.

Those few figures show the extraordinary effect of sewage irrigation upon sterile sand; indeed, the growth of grass the following year was still greater. Although rye-grass is the best for irrigation, because it not only withdraws, by its fine roots, most surely the organic matter contained in sewage (according to recent observations even animal substances direct, like insectivorous plants), but also favours, by the intertwining of its roots, the filtration of water, it was found necessary to attempt also other products of the field, as no buyers could be found for the great quantity of grass obtained, and there was not a large stock of cattle in the neighbourhood. Mr. Aird had to decide whether he was to acquire a large farming stock and become a cattle-breeder, or whether he was to proceed to utilise the irrigated area in another way. Beets, wheat, rye, rapeseed, mustard, and tobacco were grown; next, vegetables were attempted; and, finally, also flowers,—the latter for their seeds. Besides the area under cultivation by him direct in 1876, 36 morgens were devoted to vegetables and flowers, and 244 morgens let out on leases. The farmers grew especially swedes, summer corn, and tobacco (18 morgens). The cultivation of the latter is said to be very remunerative, and the tobacco, if not a Havanna leaf, to be certainly of a good flavour.

But not only the dimensions of the area cultivated have increased, the yield has become better paying, even handsome. A proof of this is, that already half of the irrigation area is let. In 1876 from 15 to 20 thalers were paid per morgen; in 1877 the offers went up as high as 24 thalers per morgen, or about 5*l.* per acre, and this for soil formerly dune sand. Those rents are explained by looking over the yields as given in the table below:—

Cereals, &c.	Seed sown.	Yield of Corn.	Straw.
	Scheffel.	Scheffel.	Cwt.
Winter wheat	1·20	15½	22½
Winter rye	1·10	12	29
Summer rye.....	1·35	9	12
Barley	1·40	11½	12
Oats	2·00	21½	16
Winter colza	1·40	13½	—
Winter rapeseed	1·10	14	—
Summer rapeseed ...	1·60	9½	—

In 1876 from 200 cwt. to 320 cwt. of swedes, according to the age of the irrigated field, were obtained per morgen. Tobacco yielded about 13½ cwt. The cereals grown were good, partly excellent (rye, oats, summer rape), and sold

readily at market rates, as well as the straw, which was very healthy. Swedes fetched in 1876 from 10d. to 11d. per cwt.; tobacco 1*l.* 11s. 6d. per cwt. The yield of hay was in the second year (1873) in the area on which Timothy and clover were grown from 26 cwt. to 27 cwt. per morgen, and sold at 3s. 9d. to 4s. per cwt. The area planted with vegetables, and flowers for seed, yielded 110 thaler brutto per morgen. Mustard gave 5½ cwt. per morgen.

An important question arose as to how the irrigation system would work in winter. Danzig is much exposed to the tempering effect of the sea, but still the winters are very severe. But since the beginning of the irrigation, the latter has been carried on throughout the winter without difficulty. The sewage arrives on the field even if the cold weather is continuous; at most a thin ice crust is formed, below which it runs and sinks into the ground. As the growth is then at a standstill, even of rye-grass, it will not be frozen out. Newly prepared ground is principally irrigated in winter, so that it receives a thorough manuring then.

The consumption of sewage-water in summer is already so large that additional water is let into the drains from the river Mottlau. The large quantities of water which are thus daily brought on to the irrigation area must, of course, find a natural outflow. This is, in the first place, the ground-water, the level of which is from 3 ft. to 5 ft. under the surface. The filtrated water collects in small ditches, which lead into larger channels, emptying directly or indirectly into the Vistula.

Of course, we might give detailed statistics of the indirect benefit conferred by the drainage works on the health of Danzig. But this not being within the scope of the present inquiry, though an important consideration in all sewerage undertakings, we need only remark that they are most striking. To mention only one instance, frequently the cause of great mortality, that of typhus fever, generally the result of bad drainage. In 1868 the deaths from that disease were eighty-nine; in 1876 they were only twelve.

The above statement will give our readers a fair idea of the Danzig works, and the prospects of similar undertakings in Germany. We may, however, point to the case of Danzig as one in which the change from the formerly prevailing abominable system,—system is almost too good a word for a state of matters where everything was worse than chaos,—to a well-regulated arrangement of sewerage and sewage irrigation, coupled with a bountiful supply of pure water, has been most beneficial.

Altogether, the results have been astonishing. On the one hand, a desolate moving dune district has been changed, as if by the wand of an enchanter, into fertile fields and garden land. On the other, a city, formerly the permanent stronghold of filth and disease, the soil of which was reeking with unclean accumulations, to which additions were daily being made,—its inhabitants breathing the noxious effluvia which such a combination of nastiness produces, and drinking poisonous water,—has been transformed into a healthy city. What is more remarkable, the change has been effected at a comparatively moderate cost. Indeed, the expense must be looked upon as small when we consider what an immense amount of good has been done.

The subject concerns us so closely that we shall recur to it on a future occasion, when we propose to treat of the sewage and irrigation works of the larger German cities, especially its capital.

School of Wood-Carving.—With a view of encouraging the art of wood-carving in this country as a branch of the fine arts, the Council of the Society of Arts propose to apply to that object a grant placed at their disposal by the Drapers' Company for promoting technical education, as they are at present in a position to secure the services of an eminent Florentine artist, Signor Bulletti, to take charge of the classes. Messrs. Gillow & Co. have, with a view of aiding this national object, secured the use of a suitable house wherein to commence operations. They will also lend the necessary plant and models, and undertake to secure a sufficient amount of work for a year. On this basis it is hoped that a School of Art Wood-carving may be established. The Council will select and pay the fees for six months of four day-students, who must undertake to attend.

THE HIGH SANCTUARY AT JERUSALEM.*

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE object of the present paper is to give as concisely as possible an account of the principal results of various explorations in the area of the "High Sanctuary" at Jerusalem, which have been carried out during the last twelve years by professional engineers and architects. These explorations include the Ordnance Survey by Major Wilson in 1864, the explorations by Capt. Warren in 1867-8-9, the explorations by M. Clermont Ganneau and M. Le Comte in 1874, and my own work, including two or three discoveries during 1873-4-5. In addition to which the magnificent volumes of M. De Vogüé have, perhaps, almost exhausted the epigraphic and historical information connected with the subject.

Two questions entirely separate from one another are included in this inquiry. First, that of the Jewish buildings in the area and of their existing remains; secondly, that of the various Christian and Moslem erections dating later than the Christian era. These two subjects can hardly be made too distinct or independent.

The great enclosure called *Haram es Sherîf* or "High Sanctuary," is an area partly founded on rock, partly formed by earth, which is supported on extensive vaults and banked up between retaining walls of magnificent masonry. The total extent is about 35 acres, one-sixth of the area of modern Jerusalem. The form of the enclosure is a trapezoid, having right angles at the south-west and north-east corners, and an angle of 92 deg. 30 min. at the south-east. A platform having an area of about 5 acres rises in the middle of the Sanctuary; its surface is paved, and, roughly speaking, level, being about 15 ft. above the exterior. The remainder of the Haram has an irregular surface, and is planted with olives and cypresses. The platform is a quadrangle, but none of its sides are equal, nor are any of its angles right angles. Flights of steps lead up to it on every side, and screens supported by slender columns stand on the top of the flights. The two principal buildings on the platform are the octagonal chapel called *Kubbet es Sakhrah*, "Dome of the Rock," and due east of this the smaller decagonal chapel called *Mahkamet Dâûd*, "Tribunal of David," better known as the "Dome of the Chain." Their position on the platform is not central, nor is their axis square to the east and west walls of the platform. Two smaller domes exist north-west of the main building, and on the north, south, and west small modern chambers are built against the sides of the platform. The mosque itself, called *Jamia el Aksa*, or "The remote meeting-house," is built against the south wall of the Haram, over a long vault running north and south, which is known to the Moslems as the "ancient Aksah." The other principal features of the Haram may be briefly enumerated. On the east wall is the fine double gate-house called *Bâb el Tôbe*, or by Christians, "The Golden Gate." In the south-east corner of the enclosure are the extensive vaults commonly called "Solomon's Stables." In the north-west angle is the minaret standing on a rock-scarp near the barracks. Cloisters surround the open area of the Haram on the north and west, and numerous ancient tanks and passages, some of which require special description, exist below the surface in all parts of the enclosure.

The rampart walls of the Haram first claim attention as being the most ancient of the existing remains. Captain Warren's excavations have shown them to be founded on the rock, and have proved that the ancient masonry now visible above the surface is *in situ* and identical with that existing beneath. The western, southern, and eastern walls of the Haram have been pretty thoroughly examined. Three kinds of masonry are found in them throughout: firstly, megalithic drafted masonry; secondly, large and well-wrought ashlar without a draft; thirdly, small masonry,—a patchwork of plain, chiselled, and drafted stones of various dimensions. The order of occurrence throughout the enclosure is the same. The first style occurs at the bottom, and is surmounted by the second, which, as will appear, belongs to the Byzantine period. The small masonry,—Crusading and Saracenic,—is found above the rest, and the battlements are the most modern part of the whole structure.

Of the ancient drafted masonry with which only we are at present concerned, three varieties have been found. The first kind is that of which the walls are principally built. The stones have an average height of about 3 ft. 6 in., but some of the courses nearest the top measure 3 ft. 10 in., while stones of 2 ft. 10 in. and 4 ft. 3 in. in height occur near the foot of the wall. The dressing is extremely fine, and in the best-preserved specimens the boss projects only ¼ in. The draft is generally about 3 in. wide on each side, but in cases where the wall has a set back or batter, the drafts at the top and bottom of each stone are of double width, by which means the effect of uniform width for each sunk plane was obtained. The stones vary considerably in length, the longest yet known, at the south-west angle, measures 38 ft. 9 in., and the second longest, on the north-east, is 23 ft. 8 in. The material is a fine limestone, from quarries under Jerusalem. The hard and soft veins have been used indiscriminately, and but little attention has been paid to the quarry bedding. Some of the stones show, by the trickling of the paint from the marks on their faces, that they have been turned upside down in the wall after leaving the quarry. Hence it results that the masonry has weathered in a very irregular manner, and that some of the stones have entirely crumbled, while others remain in good condition. The carelessness thus shown in the selection of material, in the proportions of the ashlar, and in the angular measurements of the building, contrasts curiously with the immense labour required in moving such large blocks, and with the wonderful fineness and accuracy of the jointing.

The tooling of the faces in the drafted stones is peculiar. After examining the dressing of stones in almost every large building in Palestine, I am able to say that this dressing only occurs, as far as has yet been found, in the masonry of the Jerusalem and Hebron Harams. The draft is dressed with a chisel having eight teeth to the inch, which was driven in two directions at right angles, so as to produce a regular criss cross pattern. The same dressing extends over a band, 3 in. wide round the four sides of the central boss. The rest of the boss is finely dressed with a point.

The second kind of drafted ashlar is found at the south-west corner of the Haram, extending for a distance of about 200 ft. along the south and west walls. The faces of the stones are hammer-dressed, and project some 6 in. or 10 in. beyond the draft. The third variety of drafted masonry consists of blocks yet more roughly finished, with faces projecting 18 in. to 25 in. It is found on the east wall near the north, and is distinguished by Captain Warren from the second style. There is evidence to show that the roughly-finished masonry was not visible above the surface at the time when the wall was built, and there are indications that it is of the same date with the smoothly-finished masonry. Both on the east and on the south-west a valley bed runs through the interior of the Haram, and the rough stones are employed to fill up the hollow; on the south-west the highest rough course is at the level of an ancient pavement, 20 ft. above the rock, while the courses above have the bosses of the stones finely dressed. At the south-east corner the smoothly-finished stones occur to the very foot of the wall, because the ground here falls sharply eastwards, and there was thus no hollow to be filled up, and the wall was originally, perhaps, visible to the very base. Smooth-dressed masonry is found standing on the rough, and smooth-dressed stones have been found in the rough courses, while rough stones occur among the smooth near the base of the wall on the south-east. The voussoirs of the great bridge stand on rough masonry, but have the criss-cross dressing found on the smoothly-finished stones. Thus there is apparently no reason to conclude that the roughly-dressed drafted masonry is of different date to the smoothly-finished drafted stones.

Starting from the north-west corner of the Haram, we may now glance at the special characteristics of the great walls, following them southwards, eastwards, and again northwards. The north-west angle is occupied by a block of rock scarped on the south, north, and east, measuring 350 ft. along the north wall of the Haram, and about 100 ft. north and south. The highest part is 40 ft. above the Haram court. The north scarp of this block of rock is visible in the Twin Pools, two parallel reservoirs which run at a level of 40 ft. below the present road. They are formed by roofing in part of an old fosse 165 ft. wide, which separated the

* By Claude R. Conder, Lieut. R.E. Read December 2.

Haram hill from the higher hill north of it. The northern scarp of the fosse has been traced for nearly 300 ft. The great block of rock above described is now occupied by a barrack, its exact boundary on the west has not yet been determined, because the top of the rock is covered in this part with modern buildings and with rubbish. The Twin Pools are certainly as old as the fourth century. They are described by many early writers under the name of Bethesda, and the wagon-vaulting of the roofs has the peculiar character which appears to belong to early Byzantine work. The fosse itself is, however, probably still older, and extended westwards for at least 200 ft. beyond the Pools.

From the south-west corner of the Twin Pools a magnificent rock-cut passage runs southwards for 200 ft. It is at first nearly 50 ft. high, but at the further end it is barely high enough for a man to stand in. The average width is about 4 ft. throughout, and the roof is of flat slabs. This gallery, which, from the dams built across it, was evidently once an aqueduct, was first discovered by Captain Warren in 1868, and in 1873 I also visited it, and reached the end, where it turns sharply round and is cut by the Haram wall, on the other side of which are two large and ancient cisterns, with which, perhaps, it originally communicated. The Haram wall is here visible, founded on the rock, and built of finely-dressed drafted masonry. During my visit we were also able to make a yet more interesting discovery by scrambling through the floor of a little modern chamber over the aqueduct. We found ourselves standing in this chamber about on a level with the interior of the Haram, which we could see through a window, and we found the ancient drafted masonry *in situ* reaching up this level. In no other part of the Haram has it yet been seen at such a height. The lintel over the window was of equal size with the rest of the large stones, and the opening appeared to be part of the original structure. It had long been suspected that the Jerusalem Haram, like that at Hebron, must have been adorned with buttresses projecting from the wall on the outside. It was, therefore, very interesting to find that the wall above the level of the interior surface of the Haram was set back with a bevel, leaving a buttress projecting 18 in. and 4 ft. 6 in. in width. Another buttress existed in the corner of the chamber, and the space between the two was 8 ft.

The west wall of the Haram is hidden throughout the greater part of its length behind modern buildings. It has, however, been explored immediately north of the Jews' Wailing Place, where a shaft was sunk through the floor of the Pool el Burak, reaching the rock about 100 ft. below the present top of the wall. The smooth-dressed stones here extend to the rock, but it appears almost certain that the original surface was 30 ft. above the rock, for a very ancient chamber was found at that level by Captain Warren, and part of a causeway supported by a pier of rude masonry. The roof of the Pool el Burak is spanned by a fine round arch, discovered by Major Wilson, R.E., which, from the character of its masonry, Captain Warren considers to be not earlier than the fifth century. A maze of vaults and arches of various dates, supporting the present road, exists west of this more ancient archway.

At the Jews' Wailing Place the masonry is well seen, the wall reaching up 40 ft. above the present surface outside. Immediately south of this place is an ancient gateway spanned by a magnificent lintel, 6 ft. 10 in. high, and about 25 ft. long. This gateway, known as the "Prophet's Gate," leads to a vault which runs in eastwards, and which communicates with the interior surface of the Haram by steps.

Another series of shafts was sunk by Captain Warren near the south end of the west wall, where the skewback of an ancient bridge was discovered by Dr. Robinson. The rock was here found 115 ft. below the top of the wall, and a pier supporting the west haunch of the arch was also examined and found to stand upon rock. One of the most striking discoveries made by Captain Warren relates to this bridge. He found the voussoirs fallen from the arch resting on a pavement 20 ft. above the rock; and sinking through the pavement, and through the *débris* on which it rested, he found a voussoir, belonging to a yet older bridge, jammed into a rock-cut drain at the foot of the wall. It was thus proved that two successive bridges must here have existed; and the later bridge, as shown by the dressing of the voussoirs, may be contemporary with the drafted masonry of the walls. The masonry beneath the pavement was here found to be more roughly dressed than that above. The drain beneath this bridge was traced, and led to two rock-cut cisterns; one of which was cut in half by the Sanctuary wall. North of this, again, the passage led in the direction of a large reservoir, called *Hammam esh Shefa*, with which it may probably have communicated.

The total length of the west wall is 1,600 ft. The south wall is at right angles to it, and measures 922 ft. outside. The rough masonry is found for about 200 ft. from the south-west angle to a point where the rock rises above the level of the pavement found under the great bridge. The rough wall is, roughly speaking, trisected by the two famous passages leading to the Double and Triple Gates, which have their sills on the same level with the Prophet's Gate, 60 ft. below the top of the wall. At the south-east corner of the Haram, the ancient masonry extends nearly to the top of the wall, and the total height is 160 ft.; of which height only half is now visible above the surface. Captain Warren discovered, on the south wall, a course of stone extending westwards for about 600 ft. from the corner, and having a height of no less than 6 ft. This *master course* also runs north from the south-east corner for about 25 ft., and seems to indicate that the walls throughout form one complete structure, although the high course has not as yet been observed west of the Double Gate.

The east wall of the Haram, 1,530 ft. in length, has been examined in five places. Near the south-east corner Captain Warren found the famous red painted letters, which, as a writer in the *Edinburgh Review* has remarked, show the courses to which the various stones were intended to belong. The character used is the Phœnician, or Aramaic. It does not, however, prove these stones to be of the time of Solomon, for the same character is found on the Maccabean coins, and was apparently in common use at a yet later period. The most remarkable discoveries on this side of the Sanctuary were,—first, the fact that the great wall runs past the present north-east corner of the Haram without any break; second, that the masonry north of the Golden Gate is of a distinct character, and much rougher than the rest of the wall; third, that a valley, 140 ft. deep, runs across the north-eastern part of the Haram inclosure. Captain Warren's shafts were here sunk more than 100 ft. below the surface before reaching the rock.

A few words are required with regard to the north wall of the Haram. There is as yet no evidence that this wall is of equal antiquity with the other three, and there are indications which seem to show that it may be later. The great reservoir, known as the Birket-Israil, is built against this wall on the outside, and occupies about one-third of the length. Various houses hide the exterior west of the Birket, and the western portion of the boundary, for 350 ft., is formed by the great rock scarp already noticed. All the four sides of the Birket have the same masonry of small and ill-cut stones, some being rudely drafted. The joints are several inches in width, and packed with smaller stones. In one place the stones have fallen out, and a second similar course is seen behind. Such masonry is found in other parts of Palestine, connected with buildings of the Byzantine period. The Birket-Israil is apparently not mentioned by Josephus. One doubtful reference to it has been found in the fourth century, but it is only in the twelfth century that it is first described clearly, and it forms a feature in the topography of the city from that time. The small masonry of its walls was once covered with cement. It seems unlikely that behind the two rows of stones lining the pool any of the old drafted masonry can exist, for the latter would surely have been better fitted for holding the water, and would thus scarcely have been faced with inferior work. In addition, it is found that the cisterns on the inside of the wall are not earlier than the twelfth century; they have groined vaults, like those used by the Crusaders, and pointed arches. No rock has been found in this part of the Haram, because of the valley, which, as before stated, runs across it.

Taking into consideration the change in the character of the drafted masonry on the east wall north of the Golden Gate, the fact that this wall does not terminate at the present north-east corner of the Haram, the character of the north wall of that inclosure, and that of the vaults within, it seems on the whole probable that the north-eastern part of the Haram did not originally form part of the great inclosure bounded by the ancient walls. Further examination of this corner is, however, highly desirable.

Turning next to the consideration of the original surface of the ground within the Sanctuary, our attention is first directed to the *Sakhrah*, or "rock," the top of which is the highest point of rock which exists within the inclosure, although the top of the great scarp at the north-west angle is about 20 ft. higher. The *Sakhrah* occupies the whole space under the dome of the *Kubbet es Sakhrah*, the highest part or crest being about 5 ft. above the floor of the chapel. Beneath it is a cave, about 25 ft. square and 7 ft. high, reached by a flight of steps on the south-east. A shaft is sunk from the surface of the *Sakhrah* through the roof of the cave, and a second shaft is said by the Moslems to exist in the cave-floor. This latter is the famous "Well of Souls," the exploration of which remains to be accomplished.

The general level of the rock, which falls in every direction from the *Sakhrah*, has been determined by seventy-five actual observations, and by the negative evidence which the present surface and the level of tanks not cut in rock afford. The observation of the rock-levels is a matter of primary importance. It is true that the rock may not have been visible throughout on the ancient surface, and, indeed, we know from Josephus that on the side of the city the valleys were filled up with earth, and we find that ancient pavements here actually exist 20 ft. above the rock, ancient gates leading out to a higher level than the rock, and ancient rough masonry once covered up with earth. Nevertheless, it is only by tracing the rock that we can feel sure of the original form of the hill, and of the depth of foundations required to support the massive buildings of the Temple.

The general result of the observations shows a spur of hill running from the north-western corner of the Haram. The ridge passes through tha *Sakhrah*, and falls 60 ft. to the Triple Gate. The western slope is much steeper than the eastern, and in the north-west corner of the Haram the surface has been artificially lowered and levelled, having a vertical scarp 40 ft. high.

The rock is hidden beneath the platform, except towards the north-west; the platform is supported on vaults on the south and south-west. On the south-east a most interesting exploration remains to be accomplished. A doorway, flanked by two windows, all three being built up with modern masonry, here exists in the east retaining-wall of the platform. It clearly indicates a vault hitherto unexplored running under the platform.

Such, then, is a brief account of the ancient ramparts of the High Sanctuary, and of the area which they enclose. With the exception of an area of about six acres in the north-east corner, there seems no reason to conclude otherwise than that the ancient walls of the Haram are of one date, and form a single structure. The masonry is the same on the east, south, and west; and no break or straight joint has been discovered in any part of the walls where shafts have been sunk.

The question then arises: Is this area of the High Sanctuary to be identified with the Temple enclosure in its final condition, when enlarged and rebuilt by Herod? The various indications of date for the walls are as follow: First, the dressing of the masonry seems to show that it is of the date of the second or late bridge at the south-west corner, which cannot well be earlier than the time of Herod; second, the fact that three ancient rock-cut aqueducts were built across, and so rendered useless in constructing the Haram walls, indicates a comparatively late date for the drafted masonry of the west wall. It will, however, be shown that the drafted stones cannot be dated later than the time of Herod; for, in the subsequent rebuilding of the Haram, large undrafted masonry occurs in connexion with early Byzantine architecture above the drafted masonry.

It is generally agreed that the great bridge in the south-west angle of the Haram is that described by Josephus as leading to the royal cloister of Herod's Temple, discovered by Dr. Robinson and Captain Warren. The description given by the same author of the rock on which Antonia stood overlooking the Temple, and divided by a fosse from the Hill of Bezetha,

so fully agrees with the appearance of the rock in the north-west corner of the Haram that we can hardly hesitate to identify the two. At the south-east angle Captain Warren discovered an ancient wall running from the south to join that of the Haram. This answers to the Ophel wall, which Josephus describes as running from the south, to join the east cloister of the Temple, and this discovery serves to fix the south-east angle of the Haram as being the south-east angle of Herod's Temple.

It remains to determine the ancient north boundary of the Temple. This requires further exploration; but the change in the masonry near the Golden Gate perhaps indicates the ancient north-east corner, and it is interesting to note that Captain Warren discovered a row of rock-cut buttresses projecting from a scarp which runs east and west, and the line of which if produced cuts the point on the east wall where the change in masonry apparently occurs. These buttresses may be compared with those before described as adorning the west wall, near the north end. The line thus indicated is that of the north side of the present platform, and the east wall of Antonia may perhaps be defined by a line running south from the south-east angle of the great rock scarp. Further excavation in this direction is, however, much needed.*

ARCHITECTURE AT THE PARIS EXHIBITION.

FROM THE POINT OF VIEW OF AN ITALIAN ARCHITECT.

THE ninth and tenth numbers of the professional journal, *Il Politecnico*, of Milan, open with an account of architecture as represented at the Paris Exhibition, written by the Italian architect, Luigi Broggi, and which was read before the College of Engineers and Architects in Milan, at their meeting on the 1st of September last. In giving to our readers some account of this important paper, we must be understood as expressing the views of the writer, without, unless by direct reference, either endorsing or opposing them. Their interest is the more striking from the position held by modern, as well as by Mediæval and by Classical architecture, in Italy; and from the close organisation under which engineers and architects in that country carry out the works of the united professions.

Architecture has often been called, remarks Signor Broggi, the art of arts, as philosophy is the science of sciences; and it is correct to speak of architecture not so much as an art by itself, as a combination of all other arts. Thus, when we examine a noble edifice, or an architectural monument, we regard not the perspective outline of the elevation alone, but the decoration, and the harmony of the tints, or, in other words, the drawing, the sculpture, and the colouring.

From the more or less happy combination of these arts springs architecture, good or bad. When the combination is the conception of a truly superior genius, we have that complex, nameless, divine art, which may be called the daughter of Michelangelo, and the mother of all the noble monuments erected in Italy since his day.

Few persons, at the present day, regard architecture in this light. It is more common to find the beauties of ancient art crippled and profaned by their reproduction in detail, and in inappropriate circumstances. Hence arises that characterless and second-hand architecture which is the shame of the present day.

The architectural student, on a visit to Italy, struck with the colossal grandeur of the ancient edifices, laments that such work is now impossible. Such is not the true stand-point. Art demands progress, or, at all events, movement. Each age, ours like those which have gone before, has its special requirements. The fulfilment of those requirements is that which gives its special character to the architecture of each succeeding age. Thus Imperial Rome had her Colosseum; warlike ages reared their castles; religious ages founded churches, such as the Duomo of Milan, the Certosa of Pavia, St. Peter's at Rome; the epochs of artistic opulence produced the Vatican and the Ducal Palace of Venice.

The present age is an eminently practical one. The field of civil architecture becomes more vast. Commodity and economy are studied. Space is economised. The need of economising space has led to the vast architectural revolution ensuing on the use of iron as a building material.

The architectural type of our age, then, is the ordinary dwelling-house, the civil abode; characterised by the proportions and the style which are indicated by the properties of the new structural material.

But what is the ordinary practice? If we build houses, we use iron for structural purposes; we borrow a Greek, or Roman, or Lombard design for the ornamentation we cripple and impoverish our work. We borrow the model of a grand light from the Duomo of Milan to ornament a window measuring two yards by one!

This want of a characteristic architecture, fitted for the requirements of the day, and adapted to the construction proper to the use of the new material, has been most evident in those enormous buildings (which demanded such economy in their construction) which have been required for the International Exhibitions of the second half of the present century. The Crystal Palace at Sydenham is cited (by the Italian architect) as the first grand effort at the architectural employment of iron: an ingenious effort which has borne but little fruit. In fact, all the successive Exhibition buildings of Paris, Vienna, and Philadelphia have failed to signalise any progress in this special branch of construction, and have remained edifices without a shadow of character.

We pause here for a moment to remark that Signor Broggi has failed to take notice of one figure of novelty no less marked than the use of iron alone. We allude to the combination of iron and of brick, as in the case of the Alexandra Palace, and of not a few modern churches. Concrete, moreover, is now assuming great importance as a building material, and cannot fail to exert an influence on style. But that which must necessarily be unfamiliar to the Italian architect is the history of what we may call the genesis of our Crystal Palace, as to which we can speak with precision. The original idea was neither more nor less than the erection of a colossal greenhouse. When that idea was adopted, and the question of construction came to be discussed, it became evident that the utmost exertions would be needed to complete any building of the dimensions determined within the time proposed. For that reason mainly, as well as for economical reasons in the second place, it became necessary to adopt the utmost simplicity in the structural elements employed. Thus one column, and one girder, repeated over and over again, both in plan and in height, were adopted as the working unit. The same was the case with the gutters, ridge-plates, and sash-bars for the roof. The central arch, which was the chief beauty of the whole building, was the only exception to this rigid unity in the application of the simplest elements. In the ordinary acceptation of the word there was neither architect nor architecture in the original Crystal Palace. Sir Joseph Paxton's rough idea of a monster greenhouse was wrought out, bit by bit, by Sir Charles Fox and Charles Heard Wild, with the additional check of Sir W. Cubitt's opinion as to the strength, and the building was put together as a sort of carpenter's work in iron. With the sole exception of the circular roof, added by Sir C. Barry, the building, so to speak, determined its own plan and elevation; and the design of all similar edifices has thus been to a great extent controlled by the exigences of the foundry and of the forge. There was no time to design the Palace—it was built straight away.

The Exhibition building at Paris this year,—we now return to the report of Signor Broggi,—is perhaps the most unhappy of any of the series; since in addition to the common error of like constructions in applying to iron as a material a well-known style (which was not the case in 1851), there was the further misfortune of choosing the style of all others the least adapted to the material. The façade of the main edifice was heavy, distorted, and swollen, covered in the upper part with useless ornamentation; while the evident poverty of the lower part produced a horrible want of keeping. In the middle was a loggia of light iron work, supported by two corbels so colossal that it was impossible to form an idea how they themselves were supported; until one became aware that, instead of being iron castings, they were only made of wood, covered with plaster or with pasteboard,—a piece of sham work the more inconceivable the more we think of the thousand graceful forms which might have been given to really structural work in iron.

The centre of the façade was flanked by two wings, equally heavy and swollen above; narrow, mean, and disproportionate below; the main object of the architect appearing to have been to mask the iron girders which were the real constructive features of the building, by a continual application of false and useless additions, giving a constrained and laboured effect to the whole edifice, which was entirely destitute of artistic spontaneity.

The plan of the building formed an immense rectangle, 700 mètres long by 500 wide, entirely covered by building, divided longitudinally by ten alleys, intersected transversely, by ten others. Such an arrangement might have been made subservient to an orderly division of the regions allotted to the several nationalities. Nothing of the kind, however, was effected; and it took several days merely to become acquainted with the plan of the Exhibition. This want of arrangement was universally blamed.

The causes of the confusion were various, among which should be named the want of precision as to the relative space which would be occupied by the exhibitors of different countries. The broad alleys would naturally have divided great national regions. Nothing of the kind was carried out, as these alleys, instead of being kept open for the circulation of the visitors, were so crowded with stalls as to become nothing but galleries of exhibitors. The different nations were thus divided by arbitrary lines which it was difficult to detail; and the visitor was often looking at the productions of one country while he thought that he was in the region of another. Added to this the great number of annexes so complicated the plan, that immense fatigue was occasioned; and it became almost impossible to form any clear idea of the distribution of the entire Exhibition.

The Fine-Art Gallery was, perhaps, better disposed than any other; but it had the defect, in the eyes of the Italian critic, of being too much cut up into divisions of too little distinction. The series of small cabinets or chambers presented no *coup d'œil* to the visitor, who had to search about to become aware of their very existence.

The Fine-Art Gallery was interrupted in the midst by the special pavilion of the city of Paris, which was justly regarded by the mass of visitors as the gem of the entire exhibition. The admirable order which reigned here, and the extraordinary care which the city appeared to have taken to secure a becoming representation of the capital of France, rendered this the finest part of the Palace.

The Street of Nations was, perhaps, the only novelty in the Exhibition; but it could not be regarded altogether as a success. The *Rue des Nations* ought to have been the representation of the typical architecture of each country: such was not the case. Commencing with England, the first thing that struck the eye was, that with the place and area assigned to different countries it was an error to suppose that all the façades could be brought harmoniously into the same lines. Such might have been the case when the areas occupied were, if not to say equal to each other, yet, at all events, not disproportionately different. But what happened on the Champ de Mars? England had to fill 100 mètres of façade, while Persia, Turin, the Grand Duchy of Luxemburg, Monaco, and Morocco, all put together, had not more than 15 mètres, their products being crowded together behind an ill-conceived barrack like so many shops.

England met very satisfactorily the difficulty of her long line of façade, by dividing it into three separate buildings, of which one was the entrance to the section, another was the seat of the jury, and the third was the specia. pavilion of the Prince of Wales. The first gave an example of Old English architecture in the Anglo-Saxon style,—a complicated and heavy mixture of Gothic and Lombard elements. The second gave a beautiful example of a modern house. The third was a pattern of a truly princely pavilion, in that sober, simple style, of brickwork with stone dressings, which is special to English architecture. The interior was a miracle of elegance. Each chamber had its special physiognomy. The dining-room was in the old-fashioned style, having a high dado of unpolished wood, of a dark colour, with hangings of arras and old velvet. From this room

* The conclusion in our next.

was a passage into a drawing-room of thoroughly modern taste, opening on a grotto with a fountain of sparkling water. The other apartments all differed in their decorations, without there being the least want of keeping; and a thoroughly artistic taste was evident in every detail. The pavilion was a great success. The most celebrated tradesmen who supply the royal family had all done their best to adorn the pavilion of the Prince of Wales, and the result was all that is best in interior decoration.

Pursuing the *Rue des Nations*, the visitor came to the territory of the United States, where an uninteresting English façade presented no novelty whatever. Something quite fresh, however, was offered by the façade of Sweden and Norway (the two countries being combined), entirely constructed of wood, in which the natural colours of the timber were relieved by red ornaments, in admirable taste; unless it be thought that too highly architectural a form was given to the framing of the windows.

Of the Italian façade in the street of nations, Signor Broggi speaks with anything but satisfaction. He regards it as a mistake in every way. In other instances, the façade, however small, was that of a building intended to contain the necessary constituent parts of a house. Italy, on the contrary, presented a gigantic portico, without any meaning or object; and the Commission was lodged between four wooden divisions covered with paper, without air, without light, filled up with cases of minerals, so that it was difficult to make out what was intended. Signor Broggi heard many foreigners observe that the *locale* of the Italian Commission was a disgrace to Italy; a remark the justice of which was the more lamentable from the fact that a considerable sum of money had been devoted to the purposes of the Exhibition. Nor could it be said that convenience was sacrificed to appearance. The whole representation of the country was unsatisfactory.

The Italian façade either should have presented to the world the pure and elegant architecture of the Renaissance, in examples of which the country is so rich, or should have indicated the starting-point of the architecture of the future. In place of this, it represented nothing, and evinced no character whatever; neither grandeur, nor elegance, nor anything such as might have been naturally expected from the love of art natural to the country. A detailed criticism follows, wound up by a quotation from the *Figaro*, which speaks of the but little admired façade of the Italian section.

But one bit of good fortune relieved the ill-luck of Italy, and that was its vicinity to the Japanese section, of which the façade (perhaps too characteristic) was entirely incomprehensible, so that it was impossible to apply any criticism by which to judge of its merits.

Spain adopted the Moresque style, which is always one of extreme difficulty, and which looks very poor when it is not carried out with great richness of ornament. The Spanish façade had the effect of a booth at a fair.

Austro-Hungary aimed at a golden simplicity. It only presented a portico, of sober form, but not devoid of a certain modest elegance.

Russia presented a building of heavy timber, with crossed beams, ornamented with dark red and green, contrasting with the dark colour of the wood. It was a house full of local colouring, black, and cold, but not devoid of a sort of picturesque effect.

From Switzerland every one expected an elegant Châlet in modern style. Instead of this the Swiss façade was of that ancient style which is now rarely found in Switzerland, except at Berne, which is the city most faithful to the usages of antiquity. The building had that want of keeping which is invariably betrayed by the attempt to make new work look as if it were old.

The Belgian façade was so monumental, so beautiful, that no one could see it without regret that it should be destroyed. It had nothing of temporory work or sham, being solidly constructed in marble, stone, and brick. The design approached the English model, but was richer, more ornate, more admirably executed, with a solidity and luxuriance which impressed the imagination. The columns were of the purest marble, the colours of the stone harmonious. The wonder was how the Belgian Government could have gone to so much expense for a building which was to last only six months. It proved to be the case, however, that the stones and marbles were supplied by the proprietors and managers of different quarries, who took this admirable mode of advertising their several products,—a method which would have had a magnificent result if it had been adopted by a country as rich in noble building-stones as is the case with Italy. Belgium indisputably, says Signor Broggi, carried off the palm in the *Rue des Nations*.

The example of Belgium was followed, with less richness of detail, by the Government of Holland, which exhibited one of those buildings in pointed brickwork, with stone fillets and dressings, which are characteristic of the country. The ornamentation was too fanciful, and, as matter of architectural taste, far from admirable; but it had the merit of giving a very faithful representation of the most characteristic style of Dutch building.

As to Portugal, Tunis, Morocco, Luxembourg, Central and Southern America, Denmark, and Greece, Signor Broggi has thought it best to maintain a politic silence. The façades for these countries were either grouped for two or three nations together, or consisted in a row of houses with one window apiece, without any character,—either constructive or natural,—booths at a fair, and nothing more.

On the whole, while there has been something good in the *Rue des Nations*, the general want of keeping, which was perhaps inseparable from a too ambitious attempt, was painfully manifest; and, as a whole, this part of the Exhibition cannot be considered a success.

In addition to the great architectural effort of the *Rue des Nations* numerous architectural constructions have to be mentioned; which chiefly have taken the form of pavilions erected for special purposes. As to these there is very little to be said from an architectural standpoint, if we except an interesting series of pavilions for military ambulances, and of barracks for cheap hospitals, which deserve admiration for their simplicity of construction and their sanitary arrangements.

In the different *cafés* and *restaurants* there is nothing particular to mention. The object of these buildings has been to contain as many persons as possible. The arrangements have been at times ingenious, but without any artistic merit.

Passing the bridge, in the space opposite to the Palace of the Trocadéro, is a jumble of buildings of wood, of a cheapness almost affronting to the eye, from Persia, Tunis, Morocco, Egypt, and Japan, which have as much to do with architecture as the national concerts which are given in them have to do with music. In the midst of this desert of ugliness, the Swedish house forms an oasis. It is built of wood, with a finish and a provision against all atmospheric changes that are superior to those of the best Italian towns. Less architectural than the Swedish façade in the *Rue des Nations*, it is more simple, more practical, more characteristic.

Near this building, the châlet destined for the exhibition of forest products is the only châlet built with care and grace in the whole Exhibition. Everything in it is made of wood, and the value and importance of the material is there abundantly illustrated.

With regard to the colossal palace which Paris has erected on the Trocadéro for public festivities, its permanent character distinguishes it from the buildings proper to the Exhibition. The cascades at the side appear, when contrasted with examples in Italy, miserably deficient in water. The architecture of the building itself is monotonous,—the style a debased Lombard style, not easy to characterise. The hall is imposing by its size, and by the character of its illuminations. The stage is too small, the stalls and seats are uncomfortably narrow; the roof is spoiled by impossible caryatides. But what the result of a great concert to a full audience may be is another question, and one as to the reply to which high expectations may be justified.

Such is an Italian judgment on the architecture of the French Exhibition. It cannot be accused of want of frankness.

Honours from France.—We are glad to have occasion to say that Mr. Charles Barry, president of the Royal Institute of British Architects, has received a letter from the Marshal President of the French Republic, inclosing the riband and cross of an officer of the Légion d'Honneur. Mr. Barry, it will be remembered, was the English member of the International Jury for Architecture at the Paris Exhibition, and a member of the British Commission.

NAVE ROOF, ST. ALBAN'S ABBEY.

SOCIETY OF ANTIQUARIES.

At the first meeting of the Society of Antiquaries for Session 1878-79, held at Burlington House on Thursday evening in last week, Dr. W. Smith in the chair, the following letter from the President, the Earl of Carnarvon, dated "Greystoke Castle, Penrith, November 26th, 1878," was read:—

"Gentlemen,—I have to express my sincere and unqualified regret that I am obliged to address you on your first meeting for our winter session by letter instead of in person. But my absence, which is due to personal reasons of real importance, will not, I trust, prevent the full and fair discussion of a question in which I had much hoped to take part.

You will have laid before you on Thursday evening a letter,* which, as your president, I thought it right to address in the name of the Council and of the Society, to the Chairman of the St. Alban's Committee after the expiration of the session, and after the close of the council meetings I took this step after privately satisfying myself that I was fully confirmed in my views of the case by opinions of the highest weight and distinction, because time was of importance, and I was assured that it would be difficult, at that season of the year, to get together sufficient members of the Council to form a *quorum*. It would obviously be unreasonable to anticipate that on a question involving some difference of opinion, I have been so fortunate as to carry with me every single Fellow of the Society; but I hope you will at least give me credit for a desire to promote as courteously and temperately as I could those views which are embodied in a well-known circular on 'Restoration,' which conveyed the formal expression of the views of the Society, and to which my predecessor, Mr. Ouvry, adverted in felicitous language in his address for 1877. I trust therefore that the Society will see no cause to object to the course which I found myself compelled in my opinion to adopt.

At the time I wrote the letter in question, conveying as it did a protest against substituting a high-pitched roof on St. Alban's for one which has existed, as is believed, for upwards of 400 years, I was not aware that I might have availed myself of the authority of that most distinguished architect, Sir Gilbert Scott, to whose care St. Alban's was confided. In a letter addressed by his son, Mr. J. O. Scott, to the vicar of St. Alban's as recently as June 25th of the current year, he states that his father had minutely examined the roof and taken exact notes of the state of each of the main beams, and then adds these words, 'I need not say that my father's object was twofold, to preserve the old roof as an interesting portion of the abbey, and to render it sound and serviceable.' I have not overlooked the opinion which Sir G. Scott expressed in his report of 1871, that the removal of all the high-pitched roofs had detracted from the external aspect of the building. It will, however, be observed that the correction of the defect appeared to him even then to involve difficulties far too 'formidable' to allow him to propose such a change, and it is clear from the report of his son seven years later that subsequent reflection had only confirmed him in the belief that the restitution of a high-pitched roof was, under the circumstances, impracticable and unnecessary. Those who remember the glowing eulogium which was passed upon Sir Gilbert Scott in this room in the last anniversary address will understand the satisfaction I felt on finding that in urging the claims of the existing roof to preservation, I was, in fact, only endorsing the views of an eminent architect, and, if I may be allowed to say, of a personal friend.

I rejoice, however, not only to claim the authority of Sir Gilbert Scott, but to find myself agreeing with his son, Mr. John Oldrid Scott. In his letter, to which I have already referred, after stating that he had made himself 'fully acquainted,' that very day, 'with the condition of the roof,' he proceeds to enumerate various repairs, which he considers advisable. He calls them the 'usual amount of reparation,' and then adds, 'No doubt a sound roof would thus be obtained.'

In the face of such evidence as this,—evidence which I have reason to believe will be amply borne out in the communications made to the

* Quoted from and commented upon in the *Builder* p. 828, *ante*.

Society on Thursday evening,—I confess to some difficulty in understanding the resolution passed by the St. Alban's Committee on the 10th of August,—'That the roof of the nave having become ruinous, it is desirable to restore it to the original pitch, indicated by the weathering on the tower, keeping so much of the painted and panelled ceiling as is in a sound condition, and restoring the rest in a similar style.'

I am indebted to a local paper for the words of this resolution, for the committee, either from oversight or unfamiliarity with the usual practice in these cases, returned no answer to my letter; but I am probably not wrong in assuming their correctness. If so, I can only commend to your impartial consideration the curious discrepancy between the resolution of the committee and the report of the architect, and shall leave it to others to furnish the explanation it seems to demand, and to draw the inferences it seems to suggest.

On the general question I think it right to refer you to my original letter of the 17th July, which the secretary will read to you. I could add little to what I then and there said, and though my letter provoked at the time considerable criticism,—some very fair and courteous, some more distinguished by vehemence of language than force of reasoning,—there was nothing, as far as I can remember, which specially calls for a reply from me. But I have thought it due to myself and the society, and even to the memory of Sir Gilbert Scott, to remind you that, in advocating, as I have done, the preservation of the low-pitched roof, I not only gave utterance to those principles which were formally put forth by this Society twenty-three years ago, and to which it has ever since endeavoured to give effect; but I also, without knowing it, recommended the very course to which both the past and present architects have (as far as I can understand) deliberately, and after minute and reiterated examination, set their seal.

I will only, in conclusion, express my confident expectation that, whatever discussion may take place on Thursday evening, will be carried on with that perfect courtesy and good feeling which, so far as I am able to judge, always characterises the meetings of the Society of Antiquaries. To all of us, as Englishmen, St. Alban's must ever be dear, associated, as it is, with some of the earliest memories of their church and nation. On such a subject acrimonious feeling and harsh words can only tend to defeat the object we have in view, namely, to ascertain whether the existing condition of the roof furnishes any justification or excuse for tampering with the truthfulness of a great historical monument, and for resorting to a so-called restoration, which, after all, may prove to be destitute of any just pretentions to fidelity as a reproduction of an earlier roof, and will thus perpetrate irreparable mischief, and give rise to unavailing regrets. CARNARVON."

Mr. James Neale, F.S.A., then read a paper on "The Old Roof over the Nave." We give portions of it:—

The ceiling-boarding, from the rood screen to the west end, is of the poorest kind; mostly, apparently in deal in 9 in. widths, and about ⅜ in. thick. The painting of the ceiling is not beautiful, either in form or colour. I have ventured in my volume to call the decoration "daubing." It may, however, be an unskilful copy of an earlier ceiling. Over the Decorated bays, the lower edges of some of the tie-beams are chamfered, and these beams still bear traces of the original painted decoration. All these features, and others which need not be recited here, are hidden by the ceiling-boarding which is placed below the tie-beams in the whole of the ten western bays of the nave. I think, however, there is in the roofs sufficient evidence to enable us to conclude that exposed beams and recessed panels, such as those of the present choir-ceiling, existed before the present ceiling was formed over the rest of the nave,—largely with the old timbers. Perhaps putting back the ceiling panels between the ancient timbers would approach more nearly the accepted ideal of restoration than the complete removal of all the ancient timbers themselves.

Timber has been very liberally used for all important timbers, and in principle of construction, though possessing no special scientific merit, the roof does not fall short of much genuine Mediæval work. Almost all the timbers are of oak,—some of it in very good condition, and likely to last a very long time; some of it decayed or damaged and needing to be replaced at once.*

Perhaps it may be useful to glance from the great tower to the west end, and note the principals, which are so evidently good or so evidently bad that amateurs might after a cursory glance speak in a decided way about them. The twelve principals next to the tower need but few words. The very beautiful ceiling under these principals, rightfully regarded as very precious by the late Sir G. G. Scott, was discovered in 1875. It was carefully restored with all the thoroughness which characterised the work of that great master, whose death we all so much lament. The decoration on the soffits of the visible beams forms a portion of the general scheme of the ceiling. I felt during my examination that I could pass less critically over this part of the roof; as artistic work of this value could never have been left by Sir G. G. Scott surmounted by a roof in any way inefficient, or likely to prove so in the course of a generation. There was not much decay of timbers, and as well as in the work over the Decorated bays, the construction was better than that of the roof over the Early English bays. The tie-beams at the western portion I classed in my notes as four bad (must be replaced), four middling (might be repaired), three good. A certain number of the rafters and other timbers in this portion of the roof are decayed in parts,—some seriously, others slightly. This is the worst part of the roof for several reasons. The outward movement of the south wall apparently displaced the gutter, and the tie-beams were probably exposed to the weather during a period of neglect. I omit further detail as to the principals.

To sum up the whole matter shortly: Out of thirty-two principals, the twelve next to the tower need not come into question, for the reasons stated above; twenty then remain. Suppose we put the thoroughly good principals at four,—at the lowest number that seems at all likely,—sixteen are then left. Allow that half of these would be better replaced (an extreme supposition) and eight repaired. It seems an extreme measure to pull down a roof 280 ft. long because 40 ft. to 70 ft. might be displaced during the substitution of new timbers in place of the worst of those now existing. I see no strong reason for doubting that the roof over the eastern portion of the nave represents the original roof erected after the completion of the stonework of the Decorated bays, about the middle of the fourteenth century. At St. Alban's, about the year 1350, a low-pitched roof was not a novelty. The roof of the ante-chapel of the lady-chapel erected about twenty-five years before has a pitch of only 21 degrees. The lady-chapel, completed shortly after the ante-chapel, is now covered with a modern roof, but the form of the east wall determines the original pitch, which was about 16 degrees. The nave roof, with 18 degrees of pitch, followed these precedents closely.

Let us examine some of the suggestions made to show that a high-pitched roof may have formerly existed. On the western face of the tower there are marks of inclined grooves having an inclination of about 50 degrees. The Norman roof very probably abutted at the level of the grooves. The pitch is the same as that of the transept roofs (50 degrees), and if the line of the grooves is prolonged to the outer face of the wall it reaches the same level as the corresponding grooves against which the transept roof abutted. With anything like the present arrangement of parapets and gutters no roof abutting against the groove could have been put over the nave. The parapets would have been about 2 ft. 6 in. higher than they are, and the tower walls clearly show that no such monstrously disproportionate parapet walls ever existed.

A good deal has been made of the *existence of mortise-holes* in different positions in some of the timbers. It has been suggested that these point to a re-adaptation of old timbers forming parts of a roof of high pitch. But in fact such mortise-holes occur so very infrequently and irregularly that nothing can be established by means of them. It may be that the timbers in which the mortises occur form part of the nave roof which was removed when the decorated bays were reconstructed.

I have limited this paper to showing what the existing roof is; what evidences there are of its date; and that it is in itself a piece of history of an interesting kind, which it would be a pity to destroy without good reason. I have also endeavoured to show that there is no good evidence that a high-pitched roof was ever put over the Decorated bays.

Mr. Street, in the course of a paper on the subject, said he had been appealed to by parties to both sides of the controversy to give an opinion in their favour, and when the secretary of the Society had written to him hinting that he seemed to shirk the question, he determined to go and examine the roof. He spoke of his intention at a recent meeting of the Institute of Architects' Committee for the Conservation of Ancient Monuments, and two of the members present, Mr. Ewan Christian and Mr. A. W. Blomfield, expressed their willingness to accompany him. On Tuesday in last week, therefore, by the courtesy of Mr. Scott, and of Mr. Chapple, the clerk of works, they went down to see for themselves, being absolutely free from prejudice on one side or the other. Before proceeding to state the conclusions at which he had arrived, he thought he ought to congratulate the Society on the extremely able and judicious letter which its noble president addressed to Lord Verulam in July last. Now, he wished to point out that what was proposed to be done, the substitution of a high-pitched roof for the present low-pitched one, was entirely antagonistic to the work which had previously been done by Sir Gilbert Scott in the restoration of the parapets, &c. If a high-pitched roof were to be put up the parapets must be sacrificed. The present roof had some merits of which many modern roofs were destitute, and if its gutters had been attended to it would still have been in good condition. At South Mimms there was a roof of precisely the same construction over the nave of the church, which he had just restored, and that, he thought, settled the question of date. He cordially agreed with Mr. John Scott when he said, in his letter to the Rev. Mr. Lawrance in July last, that the only portion of the roof which required extensive renewal was that over the four or five western bays. The advantages of not removing the present roof were many. It was impossible to suppose that the central tower would produce the same effect as at present if the ridge of the nave-roof were raised 20 ft., reducing the height of the tower from the roof from 72 ft. to 52 ft. Much as he admired Winchester, he should be sorry to see the tower of St. Alban's presenting the same dumpy appearance. Again, if the old roof were retained the old lead could be recast and relaid. The object of Sir Gilbert Scott was to restore the old roof, to which the parapet belonged. If, however, the Committee were seriously bent, as they seemed to be, on the erection of a steep-pitched roof, retaining the parapet, then their work would not be a restoration of anything that ever existed, for it would be impossible to attain the old pitch of the roof if the parapets and the gutters behind them were to be retained. The raising of the nave-roof would also render it necessary to deal in a similar manner with the transept-roofs at some future day. Further, unless he had been very much misinformed, the new roof was to be of fir, possessing no architectural character. What could be thought of such a proposal,—to substitute a comparatively slight fir roof for an oak roof which could be retained? His acquaintance with modern fir roofs obliged him to protest against such a thing being done. If the Committee could raise funds and restore the roof in its integrity in oak they would have a magnificent covering for their building, but they would require vastly more money than they at present proposed to expend. In conclusion, Mr. Street expressed a hope that the present architect to St. Alban's would pardon his seeming intrusion on his domain, for he (Mr. Street) had entered with diffidence upon the discussion, and with a desire to assist and strengthen the hands of the architect in his work. Mr. Christian and Mr. Blomfield concurred with him in all essentials, and he therefore hoped that the committee would reconsider their determination to erect a high-pitched roof. There was still time for amendment.

Mr. A. W. Blomfield said he had nothing to say further than to express his full concurrence in Mr. Street's conclusions. He believed it would be the greatest possible mistake to remove the present roof, which, as Mr. Street had said, was perfectly capable of repair.

Mr. Ewan Christian said he also quite agreed with Mr. Street. As regarded the question of the restoration of the roof, there

* The state of the case could not be better put than in the letter of Mr. John Oldrid Scott to the Rev. W. J. Lawrance, dated June 25th, 1878.

could be no doubt whatever that it needed restoring, for some of the timbers were far advanced in decay. As regarded the other portions of the roof, there could be no manner of doubt whatever that the whole of it could he satisfactorily restored. The timbers were perfectly sound at the ridge, and the principal rafters and kingposts were in as good condition as they had been in at any time during the last three or four hundred years, and they would last two or three centuries longer if allowed to remain. English oak timber, if of good quality and kept perfectly dry and properly attended to, was capable of lasting for six or seven hundred years, at the least, and it would be a monstrous shame to strip the nave of St. Alban's of its present oak roof, when quite two-thirds of it might be perfectly well restored, and that at no very great cost. The lead was not in anything like so bad a condition as that of many old roofs which had been restored, but even if it were taken off and recast it would not entail a very serious expense. There could be no doubt whatever that if the Committee were allowed to have their way,—if the present low-pitched roof were taken off, and a high-pitched roof put on,—the architect who carried out their behest would have to deal with the other difficulties which Mr. Street had referred to. The parapets must all go, and the whole aspect of the building would be changed. Mr. Street had properly said that to construct a high-pitched roof of such extent in English oak would entail an enormous expenditure, because it would require a forest of timber, and good English oak timber was exceedingly difficult to obtain in large quantities. As to substituting a high-pitched fir roof for the present oak one, and then to put under it a ceiling painted in the modern fashion in imitation of the old one, it would be as wrong and as absurd a thing as could possibly be done. If a high-pitched roof were to be erected, it would be far better to deal with the case completely, and show the roof internally. The only wise and prudent course to be followed under the circumstances was to take the old roof as it was, and restore it faithfully according to its present lines. He was certain that it could be so restored as to last for a century or two longer.

Mr. William White said he had that morning been down to St. Alban's independently, and his examination enabled him to entirely bear out what had been said by Mr. Street, Mr. Blomfield, and Mr. Christian.

The Rev. W. H. Lawrance, vicar of St. Alban's, said that Mr. Street had led the meeting to understand that the decision arrived at by the committee was in opposition to the opinion of their architect, but while Mr. Scott had stated that the old roof could be repaired and made sound, he had subsequently, at a meeting of the committee on the 10th of August, spoken distinctly in favour of a high-pitched roof.

Mr. John Evans, a member of the committee for the restoration of the Abbey, said he must say that it seemed as though Mr. Scott had deliberately eaten his words at the dictation of some members of the committee, for having given them a written report in one direction, he had turned round and advocated another course. As the local secretary of the Society of Antiquaries in Hertfordshire, he (Mr. Evans) had felt bound to bring the matter under the notice of the president, Lord Carnarvon, who, in the absence of any suggestion from the Council, wrote so admirable and timely a letter to Lord Verulam; but neither that letter nor the letter sent by the Society for the Protection of Ancient Buildings had been able to carry conviction to the majority of the committee, and the contract had been let for the erection of an ordinary deal roof with queen-posts, and it was now a question in the papers whether such roof was to be covered with tiles, slates, or copper,—in fact, the old historic abbey was likely to become a *corpus vile* on which to practise experiments in roof coverings. He maintained, in opposition to Mr. Scott, that there was no evidence of the existence of a high-pitched roof in the nave since the parapets were built. Any one tracing down the chases in the sides of the tower would see that a roof running in those lines would render gutters impossible with the existing parapets. He believed, however, that it was proposed to retain the parapets, and to get over the difficulty of making them fit a high-pitched roof by some expedient of "drops" at the sides. In adopting a high-pitched roof for the nave, the committee were not simply adopting such a roof for the nave, but for the transepts and aisles, and to put high-pitched roofs over the aisles would necessitate the stopping up of a number of the windows lighting the triforium, and it would generally lead to giving the abbey such an aspect as could never possibly have belonged to it. He only hoped that the strongly-expressed and decided opinions of such eminent architects as had spoken on the subject would lead to the rescinding of the contract for the new roof.

Mr. Charles Barry, president of the Royal Institute of British Architects, said he had listened with great attention to the exhaustive and logical argument which Mr. Street had maintained throughout his very interesting paper, and if logic and good advocacy could do it the proposed mistake would be averted. The Committee had, perhaps, acted a little hastily, and he ventured to hope that the opinion of Mr. Street, confirmed as it was by Mr. Blomfield and Mr. Christian, both of them excellent authorities of themselves, would go a great way in influencing the Committee. He regretted that Mr. Scott was not present, as he might have been able to reconcile the extraordinary discrepancy between his report of June last and his personal action some two or three months later, or might have been able to say what occult influence had caused him to alter his judgment. He (Mr. Barry) ventured to hope that in spite of the contract having been entered into, it was not too late to abandon the high-pitched roof. It crept out in the papers that there was a difference of opinion in the committee almost approaching the limits of personality. It was to be deprecated in the strongest manner that gentlemen charged as trustees over such noble fabrics as St. Alban's Abbey should indulge in personalities. Personal feeling ought to be entirely eliminated from discussions on art and antiquities, and some members of the committee should remember that they had a higher duty to perform to the public than to carry out their resolves by obtaining a catch victory over their co-committeemen at a time when it was almost impossible to get a full attendance. He sincerely hoped that the reconsideration of the matter was not yet impossible.

The Chairman having invited those who took an opposite view to speak,

Mr. J. T. Micklethwaite, F.S.A., said he by no means took up the championship either of the architect or of the committee, in whom he should be sorry to put unbounded confidence. It seemed to him, however, that a great deal of the argument which had been brought forward on both sides of the question was distinctly beside the mark. Here was a large ancient building dating from the eleventh century, and which had gone through a number of alterations from that time until the last century, and now further alterations were going on. The nave roof was out of repair, and required at least partial renewal. That roof, as most people would acknowledge, was not by any means a beautiful object. The effect of so flat a roof over so very long a nave was not beautiful, and to put a high-pitched roof would certainly, in his opinion, be an improvement to the appearance of the church. Could that be done without destroying the historic interest of the building? He thought so; for if it were agreed that a high-pitched roof would be an improvement, and that the present roof was of historical value, we should be satisfying our own ideas of propriety by raising a high roof if at the same time we could retain all that was historically valuable by leaving the existing roof as a ceiling under the new roof. Whether Sir Gilbert Scott contemplated doing that at St. Alban's he could not say, but five or six years ago he did precisely the same thing at Selby Abbey. The proposal to erect a high-pitched roof at St. Alban's must, if objected to at all, be combated on æsthetic and not upon historical grounds. What we in the present day had to do was to carry on the history of our own time; and while, in altering any ancient building, we were bound to keep everything of historical value, we were by no means pledged to the retention of every historical fact to the exclusion of æsthetic effect.

Mr. J. P. Seddon said he agreed with Mr. Micklethwaite to a very great extent. He denied altogether the assertion that St. Alban's Abbey was the better for not having the high roof which was originally intended for its long nave, and he could not see anything in the objection that the high-pitched roof would detract from the appearance of the tower, which, though picturesque in itself, surmounted a mangled building.

Mr. Street, in reply, said it was hardly necessary that he should give a serious reply to what had been said by the last two speakers. If they desired to "run amuck" at our old buildings he hoped they would not have the chance to do so. According to their view, it would no doubt be possible, on some high æsthetic ground, to prove that a glass roof would be the best thing. What he had endeavoured to show was that the existing roof could be repaired. What he understood the gentlemen on the other side to say was, "It does not matter if it can be; we want something better." But if the existing roof could be repaired and restored, that was the simplest and best course to take. In spite of what had been said, restoration meant reinstating. He thought there was yet time for the committee to rescind the contract, for he believed that the timber for the new roof had not been ordered.

Mr. Joseph Clarke said he regretted that he had been unable to accompany Mr. Street in an examination of the building. He begged to move: "That having heard the papers read by Mr. Neale and Mr. Street, and the discussion which followed, this meeting is of opinion that the existing roof over the nave of St. Alban's Abbey can be rendered sound and serviceable, and that the proposal to substitute a high-pitched roof is, under the circumstances, greatly to be deprecated, and opposed to the principles of all sound restoration."

This was carried *nem. con.*, as was also a resolution of thanks to Lord Carnarvon, Mr. Street, and the other gentlemen who had moved in the matter.

THE SOCIETY OF PAINTERS IN WATER-COLOURS.

The seventeenth winter exhibition contains a good many delightful little "bits," as well as some interesting work on a larger scale and in a more finished manner. Mr. Henry Wallis occupies the centre of the top of the room with a large work, which is, however, more or less of a sketch, called "a Sextett during the Terror" (90), the object of the title being to give excuse for the portrayal of figures in the special costume of the Revolution period, and perhaps to indicate the artist's wish to represent a certain type of character and physiognomy peculiarly prevalent in French society of that period; otherwise there is nothing in the feeling or expression of the group which emphasises such a contrast between grave events and a gay occupation as the title would lead to expect; nothing to indicate that the first violin is in danger of being guillotined the next day, or anything of that kind. Indeed, the party of high-cravatted gentlemen and their listeners seem as absorbed in the music and as oblivious of burning political questions as could be wished in the quietest epoch or country. Their bright-coloured costumes, reminding one of the dress of a certain personage in Coleridge's poem, have a rather harsh and inharmonious effect; but there is much character in the faces and persons, especially the tall staid-looking man with the bassoon, whom we should expect to be an "incorruptible" patriot; and the handsome imaginative youth, a sort of Camille Desmoulins, who plays second violin, and whose feelings are going with the music so completely. Another work by the same fine and gifted artist is a collection of figures "Awaiting the Distribution" of alms to the poor at Bruges; a smaller and much more harmonious work than the other, though with less character; the interest is rather in the composition as a whole, and the general impression which it conveys. Mr. Basil Bradley has been unusually successful in his large drawing of two St. Bernard dogs in a snowy Alpine landscape (112), which is, in fact, quite a finished work, and a very fine one of its kind. Mr. Marsh's large but more sketchy drawing, which balances it, "Tourists" (67), is not so successful; there is want of character in the figures, even for a sketch, considering the size of the drawing. Among the other figure-subjects to which less prominent places have been assigned, are some superior to any of the those mentioned, notably Mr. Walter Duncan's "A Story" (130), told in a guard-house among certain helmeted soldiers, very rich in colour and finely drawn, and full of force and expression; a single figure, called "One of Oliver's Soldiers" (140), by the same hand, is also well worth attention, as well as other smaller and

less important subjects, none of which, however, have the poetic interest and force which characterises some contributions to the gallery which we have had from Mr. Duncan in recent exhibitions. We look with great interest also on the contributions of Mr. Norman Tayler, who has developed a style and feeling of his own in various compositions, in which what used to be called "rustic figures" are combined with landscape, in a style broad yet truthful, and full of fine feeling; the best of these is "An Anxious Moment" (212), which ought to have been much better hung, but the persistency with which new and original artists are hung out of the way in this exhibition is remarkable and amusing, considering what things get on the line; nor can we the least understand why Mr. Tayler's "Greeting" (228) should get better measure in this way than the work previously mentioned, as it is certainly not the best of the two. Mr. Buckman's "A Son of the Soil" (216), shows force and directness of aim, but certainly the brown, or rather red, of the labourer's face and arms is overdone, and not like flesh in texture either. Mr. J. D. Watson sends a very cleverly-painted but not interesting group, called "Rivals" (247), the rivals being a court fool and a monkey: the attractiveness of the work consists mainly in its harmonious qualities as a study of colour, and the rich effect of the tapestry background. Some very good figure studies bear the name of J. Parker, not so familiar to us as the others that have been mentioned; "Saturday Night" (367), on one of the screens, is original and fine in colour.

Amongst landscapes, one of our greatest water-colour artists in this branch of the art, Mr. Alfred Hunt, exhibits only two or three small studies, not much for him to execute, but marked by the force and poetic feeling of which his work is never destitute. Of these "Carnedd Dafydd" and "Whitby" are the best: only in the latter we are inclined to suggest that there is a little discrepancy between the scale of the houses on the opposite cliff and the rest of the drawing: for their distance according to the aërial perspective they are surely rather large. Mr. Tom Lloyd has a very fine study of foliage on an "Autumn Morning" (221), in which the figures, however, are not equal to what he usually places in his rich and harmonious landscapes. Sir John Gilbert's works may count as landscapes, since their real interest lies more in the landscapes than the figures, in the best of his drawings at least; the "Return Home—Wind and Rain" (198) is a fine, free, windy sketch. The two Messrs. Fripp, George and Alfred, are rather in force, each in his well-known and always agreeable styles; Mr. Thorne Whaite contributes two or three sets of free, broad, open-air studies; Mr. Otto Weber's various studies of landscape and cattle (or rather cattle and landscape), from the neighbourhood of the Thames at Cookham, are quite perfect as far as they go, that is to say, as perfectly balanced and true realistic transcripts of nature; Mr. Albert Goodwin sends some fine studies (notably 19) from his favourite Dartmoor and other regions; Mr. Clarence Whaite, among several other things, a very fine study at "Tremadoc Marsh" (197); Mrs. Allingham a good many little works which go to show that landscape is not so much her forte as figures; Mr. J. J. Jenkins a slight study for what would make a very fine and impressive thing if worked out to its capabilities, "The Old Home" (129), with an evening sky behind it, and sunflowers in the foreground, and the names of Messrs. Powell, Naftel, Davidson, Dodgson, and others familiar to our ears, are to be found attached to various interesting though often slight sketches; and that of Mr. H. S. Marks to a good many small landscapes, one of which, "A Common" (328), is the best we have ever seen of his efforts in this way; but some of them lead one to ask whether an artist has a claim to have any landscape sketch hung that he may send, merely because he enjoys a high reputation as a figure-painter. However, to make amends, he sends one small figure study in his best style, a procession of mediævally-dressed personages "Going to Dinner" (364), which is full of humour and admirable in every way, and which we accidentally omitted to mention when speaking of the figure subjects before.

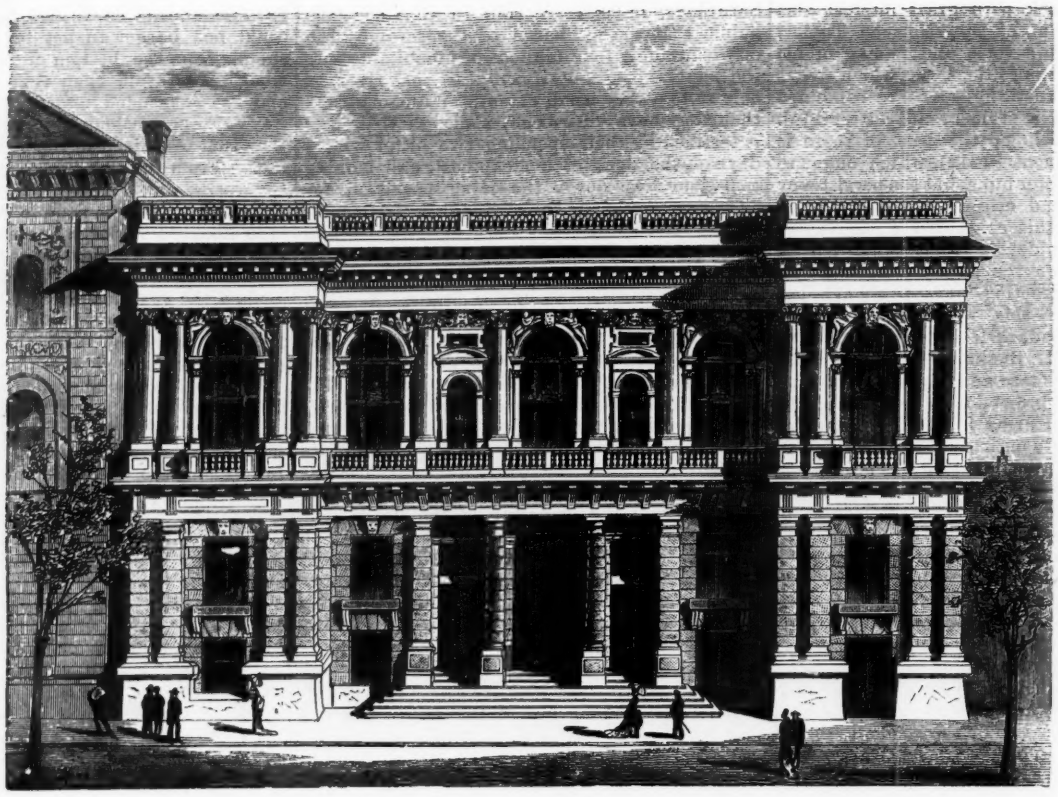
Mr. T. H. Hall Caine has been engaged by the Liverpool Library and Arts Committee to lecture at the Free Library, in January, on "Dante G. Rossetti, poet and painter."

THE CONDITION OF THE THAMES.

THE Metropolitan Board of Works and some of its officers have been engaged, during the last two Saturdays, in endeavouring to convince the public that the discharge of the sewage of a city containing four millions of inhabitants into the Thames is not detrimental to that river, or only so to a very small extent. We cannot say that they have succeeded, although their zeal is testified by their spending two bitter wintry days on the deck of a steamboat, and making two journeys down the river nearly as far as Gravesend and back, stopping frequently to test the condition of the bed of the river and to collect samples of its water and of the mud on its banks. It has been objected that these little expeditions,—not by any means "pleasure excursions," as they have been called,—have extended over too limited a period of time and season to give much value to the observations made, and there is force in the objection. The ostensible object of the excursions was to prove to the public, as represented by the press, that the Board has the best of the argument in its controversy with the officers of the Thames Conservancy. On each occasion there have been present the chairman of the Board (Sir James McGarel Hogg), the engineer (Sir Joseph Bazalgette), Mr. Keates (the consulting chemist to the Board), Mr. Bramwell, C.E.; Mr. Chatterton, C.E.; Dr. Dupré, and other gentlemen who have been acting for or with the Board in the present controversy.

On Saturday, the 23rd inst., the visitors examined the river between Woolwich and Greenwich during the last of the flood and the first of the ebb tide, with the view of determining whether the condition of the water in what has been termed the "sewage zone" is offensive or detrimental to the health of the persons living on the banks of the river or navigating its channel, and whether there were any grounds for supposing that any of the unfortunate passengers in the ill-fated *Princess Alice* had their untimely end hastened by the contamination of the river by sewage. The trip was so timed that the boat started while the tide was rising, and arrived at the time of high tide at the northern outfalls in the bend between Barking and Galleon's Reaches, whence it went down the river with the sewage, and returned against the ebbing tide, which was now laden with the full sewage outpour, the stream of which was distinctly traceable on the surface of the river. The boat arrived at the spot (about half a mile above the Barking Outfall) where the *Princess Alice* went down at the same stage of the tide as when the calamity occurred, viz., two hours and a half after flood tide. Specimens of the water, for inspection and analysis, were taken at numerous points on the downward journey, the water improving in appearance as the sewage outfalls were approached, all the samples taken being devoid of smell. When the stream of sewage from the outfalls was reached, however, the samples taken from the river exhibited particles of solid sewage matter, but they had no offensive smell.

On Saturday last the excursionists examined the same section of the river during the last of the ebb and the first of the flood tide, in order to complete the observations made on the previous occasion, but more particularly to note the condition of the banks, and (as far as possible) of the bed of the river. The samples of water taken presented but little, if any, difference in appearance to those taken at the same spots on the previous Saturday, and had no perceptible odour. Two or three enthusiasts tasted the water,—one, indeed, took copious draughts of most of the samples,—and declared that it had no offensive taste. The boat arrived over the spot where the *Princess Alice* sank just as the tide was ceasing to ebb. There was then 20 ft. depth of water at that spot, and the bottom of the river was sounded in one or two places by means of a long pole shod with iron. The manner of sounding consisted in repeatedly and quickly raising this pole perpendicularly for 2 ft. or 3 ft., and then thrusting the iron-shod end sharply down against the bed of the river. The sound emitted at the points chosen for the experiments clearly indicated the existence of a hard and clean gravel bottom. It should be stated that Sir Joseph Bazalgette invited any one who was at all sceptical to choose his own spots for taking these soundings. A grapnel was twice lowered in this part of the river. The first time it brought up nothing, the second time only one well-worn and perfectly clean small flint, with no traces of mud about it. A sample of water was here taken on the surface, and a sample was also obtained from the bottom by an apparatus devised for the purpose, and which, though simple in principle, could not be got to act for some time. The sample from the bottom of the river was somewhat more turbid than that from the surface, and the suspended matter which it contained was darker in colour and seemed to be heavier than that contained in the sample from the surface. From the foreshore opposite the Beckton Gasworks, and beneath the iron pier used in unloading colliers, a sample of the mud, which here abounds in large masses, was taken. It was very offensive in appearance, and had a not very strong odour of gas-tar. It is alleged against the gas company that they discharge a large quantity of very offensive refuse into the river. Proceeding down the river for a short distance, soundings were taken off the Barking outfalls. Exactly opposite, and at a distance of about 40 yards from the bank, the bed of the river (the depth being 14 ft.) appeared to be hard shingle. At about 100 ft. nearer the outfall arches, the depth of water was reduced to 5 ft. 9 in., and the bottom was a mixture of mud and sand. Nearer the outfall arches still the depth of water diminished to 2 ft. 9 in., a wooden pole thrust into the mud as far as it would go showing a deposit of 2 ft. 3 in. in thickness. The tide was now just beginning to flow, and the discharge of sewage had ceased some two or three hours previously. Proceeding a little further down the river, the boat arrived at the mouth of Barking Creek, an insalubrious spot, the manure-works at the entrance giving off very pungent and choking odours, and the creek itself discharging a quantity of very offensive tarry matter, called "blue-billy." This disagreeable-looking stuff was carried up the Thames in a broad, slimy-looking ribbon, which described a bold curve as it emerged from the creek. Here and at the gasworks at Beckton, Sir James McGarel Hogg and Sir Joseph Bazalgette, as was perhaps natural, made the most of such offensive matter, and of its effect on the river. The steamer then proceeded down the river until the southern outfalls at Crossness were reached. Here the specimens of water taken were very clear, and seemed to contain little suspended matter. Off Crossness pumping station, as close as the steamer could get to the shore, the depth of water was found to be 7 ft. 9 in, and the bottom seemed to be a clayey mud, somewhat dark in colour. Just in front of the main outfall, at some few feet distance, an iron tube was thrust into the bottom, and brought up a specimen of black-looking stuff of a clayey consistency, and having what appeared to be a perceptible odour of creosote. Off the Kentish bank of the river, at a point about 800 yards below the Crossness outfall, the boat hove-to while some men went ashore to obtain specimens of the apparently rapidly-eroding bank, which is of a loamy character. At this point of the river the iron tube was again sent down just at the edge of the water at about the level of low-water springs, and brought up a specimen of dark greyish-black deposit of about the consistency of putty, and quite as smooth to the touch in manipulating. There appeared to be, in the opinion of some of the gentlemen present, a faintly perceptible sewage smell about his specimen, which, with all the other specimens of water and mud taken during the two days' proceedings, will be analysed, and the results published. The steamer then proceeded down the river as far as Northfleet Hope, a short distance below Broadness Beacon, on the Kentish bank. On either side of this beacon the loamy bank of the Broadness salt-marshes for a mile or two is rapidly crumbling away, and it is obvious to the most casual observer that a great deal of earthy matter must be washed into the river from the bank at each rise of the tide. Large pieces of the bank, with the vegetation still upon them, lay strewn on the foreshore, to be washed and partially disintegrated by the next tide. Sir Joseph Bazalgette and Mr. Chatterton stated that further evidence of the rapid erosion of this bank was to be found in the fact that in Burstal and Bullock's survey of the river, made in 1831-32, Broadness Beacon stood some 30 ft. from the edge of the river bank, whereas now it jutted out into the stream, and its base had had to be protected by stonework, while the river bank on either side had receded. Proceeding down the river till within a mile or so



THE ARTISTS' HOUSE, BUDA-PEST.——Herren Lang and Keler, Architects.

of Gravesend, a specimen of the water was taken from near the Kentish bank, after which the steamer made straight across the river to Gray's Thurrock, on the Essex bank, where another sample was taken. These two samples did not materially differ. The boat then returned to London, picking up one or two samples of water on the way.

THE ARTISTS' HOUSE, BUDA-PEST.

The Buda-Pest Society of Fine Arts was established nearly thirty years ago. From various causes, the principal of which was an absence of a general interest in the fine arts, and the want of countenance of the nobility of the country, which in Hungary, more than anywhere else perhaps, has to lead the way in everything connected with national progress, the society has hitherto not been able to stir up Hungarian art-life to any effort worth notice. Of course there have been honourable exceptions in the ranks of the aristocracy and the rich Hungarian clergy, and it is owing to these individual efforts that the hitherto sterile soil of Hungarian art is beginning slowly to bear fruit. Count Julius Andrassy, as president in 1863, finally shaped the constitution of the Society of the Fine Arts, within the bounds of which it has been able to labour much more successfully for the interest of art than before that date. This was fully demonstrated when it set about founding a home of its own in Buda-Pest for Hungarian art. Thanks to the initiatory efforts of the society, the Government, the twin-city, and the general public came promptly forward to assist in erecting a resting-place. The Artists' "House" of Buda-Pest (which we illustrate) was opened in November last year, by the Emperor Francis in person.

The handsome building is situate in the Radialstrasse, and is executed in ashlar stonework. Its façade is 96 ft. long, by 60 ft. in height. The lofty ground-story is surmounted by a balcony across the whole length of the façade. Two columns emphasise the principal entrance. The large round-arched windows of the upper story are adorned by Corinthian columns, and are not devoid of artistic decoration. A stone balustrade crowns the whole building, which projects somewhat at each end. The design is by the architect Herr Lang; its execution was superintended by the architect Herr Napoleon Keler. The interior of the house is of a much more decorative character than the exterior. Rich stucco work and tastefully decorative frescoes, marble, and porphyry have been lavished in order to perfect the interior arrangements. The frescoes have been painted by the Hungarian painter Lotz. The stairs are adorned by busts and statues executed by Herren Engel, Hussár, and Szász, all Hungarian sculptors.

The first exhibition of paintings, which was of an international character, and which took place in the autumn of last year, after the opening of the House, was of a most successful nature as far as Hungarian art was concerned. Though the works by native artists were limited, quality compensated for quantity, and augured well for the future.

THE NEW CITY THEATRE, AUGSBURG.

The new theatre of Augsburg, of which we give an illustration, occupies architecturally such a prominent position among the modern theatres of Europe that we feel inclined to add a few particulars respecting this handsome building.

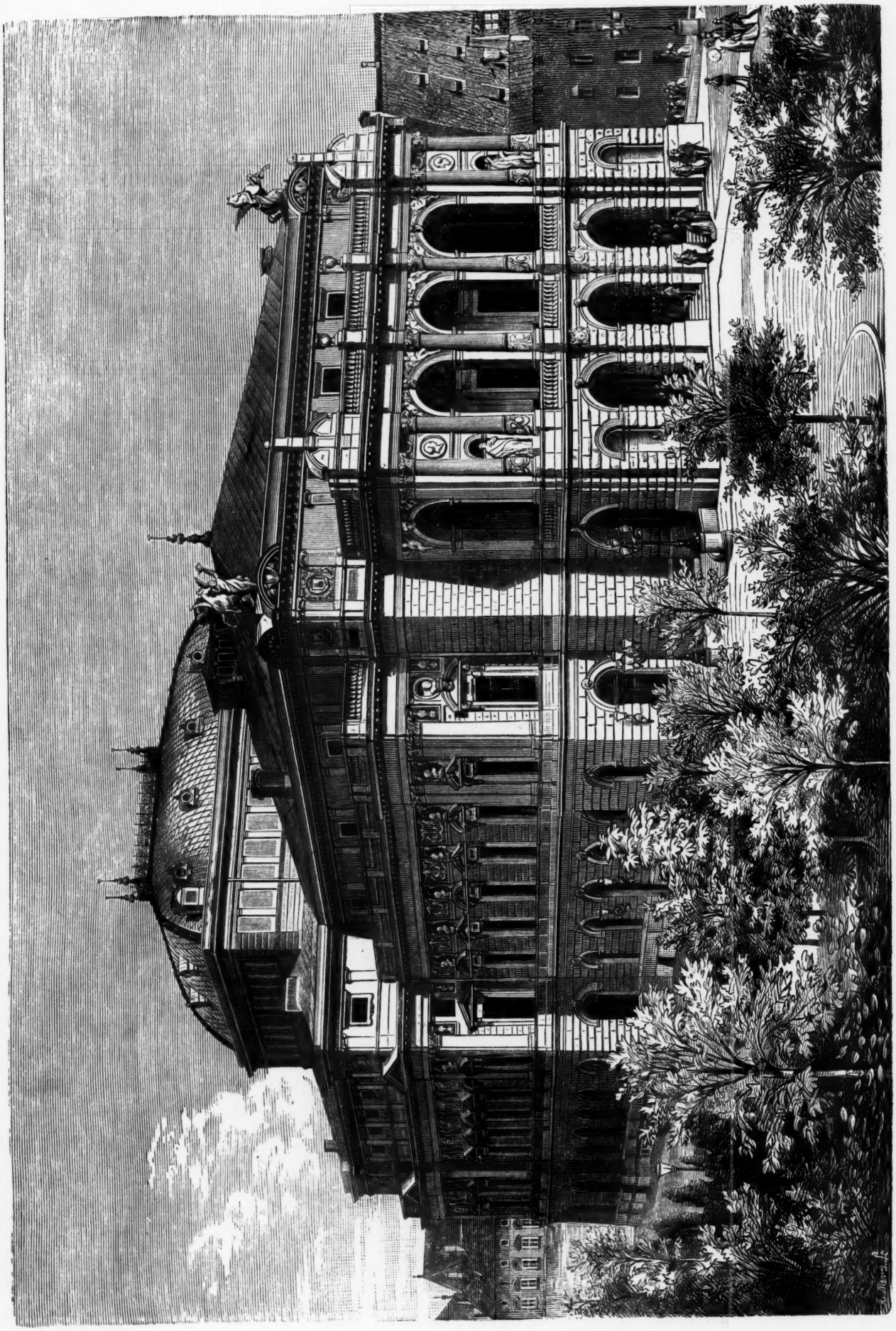
The new edifice rises at the end of the Fuggerstrasse. The architects are Herren Fellner and Helmer, of Vienna, and building operations were superintended by Herr Baurath L. Leybold and Herr A. Eysen. Works were commenced on May 1, 1876; the theatre was opened on November 26, 1877, though not quite finished in all its details.

The building stands free on all sides, its principal façade looking south, and facing the Fuggerstrasse. It rises upon a basement of heavy ashlar stone, and is in three stories. The main portion of the theatre is 324 ft. long, 135 ft. wide, and 66 ft. high, the stage rising into a cupola elevated another 27 ft., reckoning from the principal frieze below it. The façades are in the modern Renaissance style; niches have been formed over the windows of the first story, intended to receive the busts of eminent dramatic authors and composers. The building has been erected in brick, the façades being plastered with cement. The porch and loggia above it of the principal façade are entirely of stone. Grey Trent marble has been used for the smooth surfaces; the carving is in Arco limestone, the figures being sculptured in a finer stone, Medolino, from Pola, in Istria. The principal story is adorned by Corinthian columns, with carved shafts; in the centre are three large round-arched openings, separated by columns, a niche being left at either side for the reception of statues of Goethe and Schiller respectively.

The principal vestibule is entered by the great door of the porch, various openings leading into the auditorium. This forms a hall exhibiting bold arches. It contains, besides the pit, only three tiers. The upper tier rises like an amphitheatre, and unites the gallery with the third tier. Arches separate the two, and support the richly-ornamented ceiling. This is divided into eight panels, containing, alternatively, four oval and as many square encaustic paintings on canvas, and executed by Herr Lefler, of Vienna. They represent, over the proscenium, the Birth of Beauty; after which follow, to the right, Comedy, Dancing, Tragedy (Medea), Poesy, Epos and Satire, Eloquence, and Music.

The prevailing colour of the house is yellow (chamois); ceiling, balconies, and arches, are richly gilt, the arches being changed into pleasant boudoirs by brilliant red silk drapery. The richly-gilt proscenium forms a handsome frame to the principal curtain, the subject, happily chosen, being "Æsop telling Fables."

The theatre holds 1,400 persons, and there is sitting-room in the stalls for 278, in the pit for 165, in twelve pit boxes for 58, in twenty-one first-tier boxes for 123, in twenty-one second-tier boxes for 99, in the third tier for 183, and in the gallery for 136 persons. The stairs throughout are of grey Trent marble. The vestibules, staircases, corridors, stage, and all the rooms in connexion with the stage are heated by hot-water apparatus. The warming and ventilation of the auditorium are effected by pulsation and aspiration. Two powerful ventilators suck in the fresh air from outside, and lead it over hot-water pipes to a reservoir under the pit, and through the ascending channels to the boxes and gallery. Eduction of the vitiated air is principally effected by the sunburner. The total cost of the theatre, including fitting up, decorations, properties, &c., was 1,300,000 marks (65,000*l.*).



THE NEW CITY THEATRE, AUGSBURG.—Herren Fellner and Helmer, Architects.

Anna Bullen. *Dr. Johnson.* *Mrs. Siddons.*

SUGGESTIVE FURNITURE.

Lord Byron. *Lady Morgan.*

[See page 1263, *ante*.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ordinary general meeting held on Monday evening, Mr. Charles Barry, president, in the chair, a number of recommendations for membership were read, including that of Mr. J. E. Millais, R.A., as an Honorary Associate.

The following gentlemen were balloted for and declared duly elected, viz.:—As Fellows: Mr. James Williams, of her Majesty's Office of Works; and Mr. John Oldrid Scott. As Associate: Mr. Charles Edward Barry. As Honorary Associates: Mr. Francis Tagart, of Queen's Gate; Baron Seaton; Mr. Henry Andrewes Palmer, of Dulwich; Mr. Henry Simmonds, of Denmark-hill; and Mr. Charles Henman, of Croydon.

M. Gabriel J. A. Davioud, officer of the legion of honour, and architect of the Palais du Trocadéro, was then unanimously elected by show of hands as an Honorary and Corresponding Member.

With reference to St. Alban's Abbey, Mr. James Neale said it would be remembered that in July last a report was prepared stating that the ruinous and rotten condition of the roof timbers over the nave of the Abbey had been exaggerated, and that the present roof might be repaired and rendered perfectly sound and serviceable. These statements had been confirmed by Messrs. Street, Ewan Christian, Blomfield, and W. White, who last week made special visits to the building. A resolution had been passed by the Society of Antiquaries affirming, amongst other matters, "that the proposal to substitute a high-pitched roof is, under the circumstances, greatly to be deprecated, and opposed to the principles of all sound restoration." He wished to know what action the Council of the Institute had already taken in the matter, and what they were now prepared to do? If action were to be taken at all it should be immediate.

The President, in reply, stated that the matter was under consideration, and that the Council, in conjunction with the Committee for the Conservation of Ancient Monuments, would shortly take action in the matter.

Mr. Street added that the visit of himself and Mr. Ewan Christian and Mr. Blomfield was in reality the outcome of proceedings before the Institute's Committee for the Conservation of Ancient Monuments, although their account of the visit happened to be first brought before the Society of Antiquaries.

Lieut. Conder, R.E., then read a paper "On the High Sanctuary at Jerusalem," a portion of which we publish.

Mr. James Fergusson vigorously replied to some of the points raised by the author of the paper, the accuracy of whose conclusions, where they did not agree with those of Mr. Fergusson, was stoutly denied. Mr. Fergusson also complained that Lieut. Conder had altogether ignored the replies and explanations given in his (Mr. Fergusson's) work on the subject as to many of the contested points. However, the discussion was adjourned until the next meeting, when Mr. Fergusson will read a paper in reply to Lieut. Conder.

WINDOWS.*

DURING the last few years a much-disputed compromise has been largely used, viz., that of employing a large sheet in the lower sash and small squares in the upper one. I have employed this myself; I cannot say I think it wholly satisfactory. On one occasion I had to take plans for a small house before a well-known architect, and he said to me, "You don't mean to persecute your client with these small bars, I hope?" And when I said I did, he replied, "Why, when I look out of the window, it is generally through the upper pane, and I love to watch the sky and the ever-changing clouds, and I could never do this through your small panes!" And he seemed so in earnest about it that I have always since felt there is something in it; and when, on another and later occasion, a committee passed a resolution to omit the small panes in another small house of mine, I confess I did not feel quite so confident that I was all in the right, although I knew it would greatly damage the general external effect I had aimed at in the design, and so it did. Still, I thought a tenant might some day live there who also had a strong love for the sky, and he again would condemn the architect who had done so much to destroy his enjoyment of it. Some will say, "Oh! but we architects must do what we consider best, and not risk our reputations by trying to please everybody, or we shall probably be like the man with his donkey, and please nobody!" Still, we must remember that houses are built for men to live in, and their convenience should most undoubtedly be our first consideration. I confess, therefore, that I am still in some dilemma on the point myself; and though I certainly have not found out a way of employing large sheets of plate-glass satisfactorily, I feel there is some reason in the objections raised against small panes, though I do not share them as far as regards my own personal feelings. Mr. Robson, in his book on School Architecture, speaking on this subject, says:—

"In case of breakage, the danger to the children from falling glass is much slighter from moderately-sized pieces, while the ever-recurring glaziers' mending bill is in each case less. Now that modern science has succeeded in making sheets of glass larger than a dining-table, we are in danger of passing with too-rapid strides from the old-fashioned diamond quarries to the opposite extreme. There could hardly be a more complete mistake than to indulge in the taste (or want of taste) where a school is the subject."

Plate-glass we are all ready to use as a great improvement, on account partly of its great strength, and partly on account of its perfection in manufacture, so that we can see objects through it without distortion or obstruction of any kind. We all know the painful feeling of looking through "sheet"-glass, whereby objects are magnified and diminished in the most wonderful way, according to the different parts of the glass you look through; but surely the simple fact that plate-glass can be made in very large sheets does not lay on us the obligation of using it in the very largest sheets that our openings will allow.

One revolution made by the introduction of plate-glass should be mentioned, viz., the abolition of shutters; for if people could be only brought to believe it, plate-glass windows are far safer and more difficult to get through than the antiquated many-divisioned shutter, with its clumsy bar and bell, which nine times out of ten gives a warning falsely. Of course, if shutters are abolished great care must be taken to see that the sash-fastener is really what it pretends to be. Endless are the varieties brought out, each claiming to have some special advantage, and most having also some disadvantage, generally discovered only by the painful process of experience.

I will now take up a few points connected with windows internally, more especially as regards their fittings; and the first point is naturally the relative advantages and disadvantages of casements and hung sashes. Casements are the old fashion, hung sashes are the comparatively modern one, and, therefore, it is generally assumed that hung sashes must be preferable; but I doubt myself whether, in many cases, we should find them to be so, and whether we should not find that a combination of the two might not be advantageously used. The objections to casements of a large size are that they take up a great deal of room; if they open outwards they are apt to be broken by the wind; if inwards, they interfere with curtains, &c. Another objection to their opening inwards is the difficulty of keeping out the weather, unless an expensive water-bar is employed. The objections to a large hung sash are the weight of lifting and shutting, and the great difficulty of cleaning. The advantages of casements are their ease of opening, shutting, and cleaning, and, to my mind, their appearance. The advantages of hung sashes are their compactness, and their very great facilities for regulating the temperature of rooms, which is of much importance, and which certainly is not so satisfactory in a casement, unless a mullioned and transomed window is employed, when the upper portion may have sashes hung by the lower rail, and falling inwards, which probably is the most satisfactory arrangement for direct ventilation that can be. Tobin's mode of ventilation by inserting small vertical tubes with bell-shaped mouths in the lower rail of the upper sash is as good as any means for ventilation in the ordinary sash-window, and can be easily applied to existing windows. Currall's ventilator, inserted in the lower sash, is also effectual, though it might be improved in appearance. An invention worth notice in connexion with the sash-window has lately been brought out by Mr. Charles Brothers, a full-sized model of which may be seen in the Museum of Building Appliances, and a later one at Messrs. Trollope's Museum, Halkin-street. This arrangement mainly consists in hanging the whole of the sash-frame in the rebate of the window-opening, thus affording, when open, a very ready means for examination of the weights and sash-lines, &c., and also for cleaning, without any interference with the frame, as in the ordinary sash. The whole is locked when closed from the inside, and there is also an ingenious bolt in the hanging stile, which allows the window to be opened a certain way only. The top sash is also fitted with a means of ventilation through the top rail, also regulated at will. The inventor informs me that the additional cost is about 2s. a foot super. The frame is kept air-tight by an india-rubber tube fitted in the rebate of window. I have also a model here of Melville's patent lifting, lowering, and locking sash apparatus, by which the sashes are opened and shut by a small arrangement at the side, worked by a rack and pinion. This apparatus is intended more especially for large windows in basements or in nurseries, and in such other places where the window is often required to be left open a small distance and not moved by any one else. It has also the advantage of dispensing with all sash-lines, pulleys, fastenings, lifts, handles, &c. Another arrangement, invented by Mr. Abrahams, of Rosoman-street, has been brought to my notice. This, however, I have not been able to see in use. Its principle is that of the ordinary double-hung sash, in three divisions, with a centre portion opening inwards. This allows of the ingress of air, while the top sash being slightly lowered, allows of its egress. The centre portion falls down inwards flat against the lower sash, thus allowing all the glass to be cleaned from the inside.

With regard to the ordinary sash-window, the usual practice in drawing it is to take a pair of dividers and divide the window equally for the meeting-bars. I have always found it preferable to make the lower sash somewhat the larger, and in order, when open, to obtain the full advantage, to make the head of the frame differ slightly from the ordinary one, thus enabling the lower sash to go up into it and the window to open wider, and I have not found this to add at all to the expense of the frame.

Large sashes are occasionally hung on centres, as at Messrs. Tapling's warehouse in Gresham-street, but this mode is not generally convenient, and is unlikely to come into general use.

Lifts and pulls should always be used, sunk lifts being the best, and brass guards, fitted to the top rail of the lower sash will be found very useful where the Venetian blinds are placed (as is often the case where no preparation has been made for them) so that they fall on to the lower sash. Messrs. Meakin's arrangement for the opening and shutting of sash windows, though rather intricate, is often extremely useful, especially where, by reason of a large side-board, desk, or some other fixed piece of furniture, the window is not easily accessible. One other small matter in connexion with hung sashes is worth mention, viz., that it is a good plan to have the pulley stiles of the frame made in oak; it adds very little to the cost, and makes a great difference in the ease with which the sashes are moved. Another patent, by Messrs. Tonks, is worth notice for the improvement and ease of sash-lifting, besides an arrangement of lifts somewhat similar to Messrs. Meakin's. A brass guide is fixed to the pulley-stile, small wheels being fixed in the sash to run in same, which greatly facilitates the lifting of the sash. Stout unbleached hemp-cord is as good as anything for sashes of ordinary size, and this, and strong brass axle-pulleys, should always be carefully examined before any work is passed by the architect. Many metal sash-lines have been introduced, as well as numerous devices for fastening the same to sash and weights. It is advisable to connect the line with the sash about one-third from the top.

The window-opening having now been filled with sash and frame, we may briefly consider the architectural treatment of the window internally. And firstly, in passing, we may notice that splayed jambs are a modern innovation, so far as the general run of windows is concerned, and they are, moreover, a decided advantage, admitting more light. Box-shutters, one of the great difficulties in arranging the internal finishings of a window, are, as already mentioned, rapidly disappearing in face of the additional security given by plate-glass. The chief points to be kept in view in designing the internal

* From a paper read before the Architectural Association on the 22nd ult., by Mr. Aston Webb, vice-president. Concluded from p. 1246, *ante*.

finishings of the ordinary domestic window are, firstly, that they in no way interfere with the light admitted; secondly, that they are convenient for Venetian or roller-blinds; thirdly, that they are convenient for the curtains; and finally, that they do not interfere with the furniture generally. Firstly, as to light. It is important that the light should be as near the ceiling as possible. Wide architraves are, therefore, to be avoided, as, if they are continued over the head of the window, they necessarily bring down the head. Elaborate architraves also are, as a rule, only labour thrown away, for as soon as the curtains are up they are seen no more, except by the housemaids or a curious visitor. They should, of course, be in keeping with the general character of the room in which they are, but any elaborate enrichment, such as might be legitimately employed round the architrave of a door, is out of place round a window. The jamb-linings, on the other hand, which are always in strong light, might often have more attention and care bestowed upon their design than is usually the case. Secondly, as to the arrangements made for blinds. These, in the usual way, are entirely overlooked by the speculating builder. Architects often keep the soffit of the linings about 3 in. above the frame, which makes a fairly-convenient space for the blind, though it has the disadvantage of lowering the window-head. A better way is, I think, to form a box above the lining, which can receive either a roller or Venetian blind, which when pulled up would be out of sight, and obstruct no light. The usual way of hanging Venetians cuts off at least 6 in. of the most valuable light when they are drawn fully up, and when this is added to the architrave and cornice, it brings your window-head at least 2 ft. from the ceiling, which is more than it should be in a London dwelling-house, of which I am especially speaking. The third consideration in the arrangement of window-finishings internally is the hanging of curtains. One great improvement of recent years in this direction is the abolition of deep scalloped vallances, which many upholsterers will still induce your clients to have unless you keep a vigilant eye on them, not merely till the house is out of the builder's hands, but also till it is furnished; and I confess I cannot understand the feeling of those who seem to consider that the attention now paid by architects to this particular branch of their profession, viz., the furnishing of houses designed by them, is immaterial to them, for surely the internal decoration of a house has always been considered part of an architect's vocation, and a careful architect will design all his cornices, joinery, and mouldings with a view to their subsequent decoration; yet surely all this trouble is entirely thrown away if he has no voice in the furnishing. What becomes of all his carefully-selected contrasts and harmonies in paint and paper if the carpet and curtains are in discord with them? But to return to the more immediate subject before us. In place of a deep valance, cut and tortured into fantastic shapes, and imparting a funereal aspect to the room, we now use a plain brass rod or wooden pole, with solid turned ends, and on the rod brass or wood rings carry the curtains. These should be carefully selected to harmonise with the colours in the room, and should be of a length very slightly to exceed the height of the window. The old system of draping the curtains and spreading the ends over the floor tends very much to darken the room, and the curtains thus spread are inconvenient and, to my mind, unsightly. Extreme fulness in curtains is also a mistake. If they are made half as wide again as the space they have to cover when drawn they will be found quite full enough, and will not be so inconvenient when pulled back.

Window-seats are an old fashion which seems to have been almost wholly abandoned in the present day in favour of the modern window-back. No doubt the small increase of space has been the main object of this alteration, and in town houses it is still probably indispensable, but in sacrificing it we undoubtedly sacrifice one of the pleasantest seats in a room. A deep fixed seat in the window gives, too, an air of comfort to a room which hardly anything else can give.

When we consider how much the dignity and refinement in an elevation depends on the treatment of its windows, and how much the comfort, security, and health of the inmates also depend on the careful and scientific arrangement of the windows, we feel at once that it is one of the first subjects to which every student of architecture should turn his earnest attention. It is, in fact, the *summum bonum* of architecture, the one great leading feature which should bind together the elevation and plan; and, generally speaking, upon the measure of success with which this is done will depend the appreciation and merit of the design. It should be remembered that the first great use of a window is the admission of light,—full and sufficient. Gray speaks of "rich windows that exclude the light, and passages that lead to nothing." Modern architecture should not be open to this reproach. We read in the Bible that next after the creation of the world God said "Let there be light," and there was light, and after that record it is not for man to say there shall be darkness. Light and sunbeams mean life and health to all men, and he who excludes the one excludes the other. The second great use of a window is that we may look out of it and enjoy the prospect, whatever it be, and any arrangement which does not admit of this we may at once recognise as wrong (though there are, of course, cases where no look-out is preferable to the only one to be obtained). The third great use of a window is the admission of air and the ventilation of our rooms, without which we could none of us "live out half our days." Fourthly, and lastly, if we attempt fairly to carry out these three great cardinal points in the arrangement of our windows, we shall find that our elevations will become more truthful and representative of the spirit of our age, and the architecture of the nineteenth century may continue to be worthy of the title bestowed on it as "the printing-press of nations."

In the discussion which followed,

Mr. S. Flint Clarkson, in proposing a vote of thanks to Mr. Webb, said the paper was a thoroughly practical one, well thought out, and very frankly and pleasantly written. As to the proportion of window-space to the area or cubical contents of a room, in many cases it was not a matter of discretion, but one of legal enactment. Some of the bye-laws made by the Board of Works stipulated that the glass in the windows should be not less than one-tenth of the superficial area of the room. That was a rough-and-ready method of applying the rule given by Gwilt, and was approximately sufficient. Mr. Webb had illustrated in a striking manner the difficulty of dealing satisfactorily with the fenestration of an ordinary London house, for in his anxiety to improve the lighting of some of his rooms he had incurred the disadvantage of spoiling his drawing-room by a central pier which was not in the centre. In fact, the difficulty of treating such a frontage satisfactorily could only be got over, as at the Thatched House Club, by the use of a bay window, or some such expedient. He could not agree with Mr. Webb that "sham" windows were to be eschewed under all circumstances, although he thought they ought to be avoided whenever possible. It was, however, easy to conceive circumstances under which their use would be necessary for the preservation of the dignity of a façade. One point worth considering in connexion with the subject of the paper was, how to treat circular-headed windows internally, so as to accommodate the blinds to the shape of the window. He thought that might be done by providing a box into which the blind should run at the head, only leaving exposed so much of the blind as accorded with the shape of the window-head.

Mr. I'Anson, jun., in seconding the vote of thanks, said he agreed in the general tenour of most of Mr. Webb's remarks, although he could not see that it would always be advisable to proclaim the existence of a water-closet, for instance, lighted from the main façade of a building, by the mere insignificance of the window.

Mr. C. P. Edwards suggested that as well as designing windows for being fitted with blinds, they should also be designed to provide for curtain-fittings. He had seen this done in one instance by forming a recess in the depth of the cornice into which the cornice-pole or rod could be fixed, the curtains hanging down clear without the cornice-pole being exposed. In most cases the cornice-pole was by no means an ornament, and it almost required a valance of some kind to conceal it.

Mr. W. Hilton Nash said he regretted that Mr. Aston Webb had not included some hints as to shop windows in his paper, for that was an exceedingly difficult and interesting part of the subject. As regarded window-reveals, the ordinary 4½-in. reveals were prescribed by the Building Act, and the hard-and-fast line thus laid down was productive of unsatisfactory result. To bring the wooden window-frames flush with the surface of the wall would, in some instances, be productive of a much better effect, while, on the other hand, a 9-in. reveal might sometimes be used with advantage.

The Chairman having put the motion to the meeting, it was carried unanimously.

Mr. Webb, in replying on the discussion, defended "the central pier which was not in the centre" of the drawing-room portion of his façade, on the ground that it was necessary to ensure a better effect in the other rooms, and that the drawing-room admitted of being more "cut up" in its arrangement than other rooms did. He did not think that the use of "sham" windows could be justified under any circumstances, and if a man could not make a good elevation without them, he should "leave it alone." He agreed with Mr. I'Anson's objections as to the undesirability of having a water-closet window in the main façade, but the best way would be not to locate the closet there at all, but to remove it to the side or back. He thought that Mr. Edwards's proposal to conceal the cornice-pole behind the architrave was in some respects a very good one, but it would have the disadvantage of not allowing the curtains to be pulled back clear of the window and beyond the reveal; in other words, some portion of the window must always be covered by the curtains. He had purposely omitted to refer to shop-windows, though in them also nothing was more important than the omission of central piers.

SEWAGE UTILISATION AND THE POLLUTION OF THE THAMES.

INSTITUTION OF SURVEYORS.

At the ordinary general meeting of this Institution, on Monday, the 25th ult., Mr. Edward Ryde, vice-president, in the chair, a discussion took place on the paper read last session* by Mr. R. W. Peregrine Birch, C.E., on "The Use of Sewage by Farmers, or Fifty Instances of Profitable Sewage Irrigation."

Colonel Jones, V.C. (Wrexham), said that going back for a few thousand years in the course of human history, there was an old chronicle which told us that mankind had a sudden fit of desire to build a great tower which should be so tall that its top should reach to the heavens. The chronicle told us that the builders of the tower took great care to select good, well-burnt bricks, but, it added, they used slime for mortar. The natural result of this was that there were cracks and settlements in the foundations, which led to all kinds of disputes and discussions among the builders, until at last no one builder knew what another meant. As the result of these contentions, the tower was never completed. But it was not to be supposed that all the good, well-burnt bricks had been wasted, and were unfitted to be used in other structures. No doubt they were, after being cleansed from the slime in which they had been embedded, largely used in other structures under better conditions. Now it would be remembered that ten or fifteen years ago there was a general feeling in this country that we ought to have a great sewage tower built to take us up to heaven,—the heaven of complete sanitary comfort in the towns and of immense manurial wealth in the fields all round about them. A number of enthusiastic people went to work to build this erection which was to do such wonders, and they availed themselves of good, well-burnt bricks in the shape of great facts like those as to the result of sewage as applied to the land in the Craigentinney meadows, at Edinburgh, and elsewhere. Well, the building was carried on most lavishly and recklessly as to the cost of the superstructure, but a few years subsequently there arose a perfect Babel of tongues as to the proper means to be adopted for the utilisation of sewage, and it absolutely came to be doubted whether the facts referred to were really facts at all,—whether they were "well-burnt bricks" that were being used for the erection of the great tower. Now he thought great credit was due to the author of the paper under discussion for cleansing the "well-burnt bricks" in question from the slime with which they had become associated in the erection of the great sewage-tower referred to, and so preparing them for future use. His (the speaker's)

* See *Builder*, p. 544, *ante*.

only excuse for troubling the meeting with his remarks was that he happened to be acquainted with a great many of the places instanced by Mr. Birch where farmers applied the sewage to the land, to their own profit and at the same time relieving the neighbouring towns of a nuisance. As far as his (the speaker's) knowledge went, Mr. Birch had stated his facts very fairly and truthfully, and he (Colonel Jones) agreed in the main with the whole of his conclusions. There was, however, one point in which he should be disposed to go further than the author of the paper, and that was with regard to what was known as "the separate system" of town sewerage, which, he thought, was at the root of the whole subject. The whole difficulty of dealing with sewage consisted in the unfortunate addition to it, as a rule, of the uncertain rainfall, and no man, whether farmer, chemist, or precipitationist of any kind, could possibly deal with an unlimited quantity of water. The sewage farmer's greatest difficulty was to be able to provide for the sewage coming down from the town in all weathers. If he knew he had a definite quantity,—which he might easily arrive at within reasonable limits, by the water-supply of the town,—he could provide accordingly; but if he had to provide for such an uncertain quantity as in this climate was due to the rainfall,—when he knew that a single inch of rainfall over an acre of ground meant 101 tons of water, and that consequently in a town of 100 acres there would be 10,000 tons of water from a single inch of rainfall,—he would inevitably fail in the attempt. He was glad to be able to say that he had influenced the authorities at Wrexham, and that they had resolved that all future drainage works should be done on the separate system, allowing the rainfall to pass away by a separate course from that taken by the sewage. It was often forgotten in discussions on this subject that sewerage and drainage were two separate matters. We drained agricultural land for agricultural purposes, and undrained land was never used as the sites of farm-steadings or dwellings for animals, but yet human beings were allowed to go and herd together in towns without any thought being taken for the drainage of the sites of their dwellings. When, after a time, the inhabitants of a town became alive to the advantages of a system of sewerage which should take away a great deal of their refuse matter, instead of it having to be carted away, the work was carried out, and the advantage to the health of the town was often very marked, and very rapidly showed itself. Why? Not only because of the system of sewerage, as such, but because the system of sewerage was often, at the same time, a system of land drainage, the subsoil water passing into the sewer-pipes at the joints, and being thence carried away. Salisbury, one of the first places to be provided with a system of sewerage, was a case in point. Previously to the laying of the sewers, the ground on which the city stood was a great deal waterlogged, but during the course of the execution of the sewerage works, and after their completion, the level of the subsoil water was greatly lowered, and the effect on the health of the inhabitants was very perceptible and satisfactory. Some sanitarians seized upon that fact as a great argument for sewerage works, but it was really an argument for drainage, properly so-called. We ought to make the land we live upon tolerably clean and dry, and the rainfall should be carried off by separate conduits. Sewage ought to be conducted in close-jointed pipes to places where it could be most readily utilised on the land. He knew from experience that even in dealing with sewage mixed up with a good deal of subsoil and surface water, he could and did make it pay, and he knew that other farmers made it pay. He also knew that his neighbours at Wrexham would be only too glad to get all the sewage he could spare for their farms. As a matter of fact, sewage was used for agricultural purposes much more extensively than was generally supposed, and when he was consulted by town authorities as to the selection of sites for sewage farms, he generally found that some one had been "cribbing" the sewage. In one instance of a town near Manchester it was found that a farmer had been tapping the sewer for years, unknown to the Corporation or the borough surveyor, and applying the sewage to his ground with the most satisfactory results, growing immense crops of grass, and making a very good thing of it. He thought such instances were by no means uncommon. He had invited Lord Norton to attend and take part in the discussion. His lordship, formerly known as Sir Charles Adderley, would be remembered as having opposed the ill-considered Bill which was some years ago promoted by the Corporation of Birmingham for enabling the town to get rid of its sewage. He was unable to attend, but wrote:—

"Lord Norton is unable to attend the meeting on Monday, but he hopes he has made his own opinion well known,—that the right application of sewage is to re-fertilise the land, and that the one thing now to be done to render its application, even from the largest towns, practicable and profitable, is the separation of the storm water from the sewage drains. There is a perverse opposition to this final step being taken, though the cost would be repaid tenfold, and a valuable manure would be made proper use of instead of being mischievously wasted and turned into a nuisance."

That went to the root of the whole matter. It was no new idea, but had been advocated to his knowledge ever since the year 1849, but, strange to say, engineers seemed to have had a horror and a dread of putting foul water into a sewer without putting the rainfall on the top of it, on the plea that the sewers needed flushing. They forgot that the great bulk of the rainfall did not come when the sewers most wanted flushing, *i.e.*, in the hot weather. The fact was that if sewers were to be flushed at all they ought to be flushed by artificial means, but he contended they would not need so much flushing if they were used only for sewage, because they could be made smaller, and the sewage would cease to be a mere trickle in the invert of a large pipe, but would become a tolerably even flow in a much smaller pipe. The storm-water being excluded, road *detritus*,—which was deposited in the sewers by the storm water in large quantities, forming *nuclei* for the deposit of fœcal matter, which decomposed and gave off sewer-gas,—would also be kept out, and we should have cleaner sewers, which, if well ventilated, would leave scarcely any necessity for the costly valve and trap closets, many of which only served to pump sewer-gas into our houses. He was very glad to have had the privilege of attending and addressing the meeting, for it was the first opportunity he had had of giving his experience of sewage farming before a body of gentlemen professionally concerned in dealing with the question.

Mr. J. J. Mechi, of Tiptree Hall, said the question under discussion was most interesting and important, because it was really a question of our food. If anybody doubted that he ought to be prepared to advocate the doing away with the manurial system of English agriculture altogether, and then see what sort of crops we should get. It was beyond all question that that which we took from the land should go back to the land after we had used it, and the only question at issue was how that could be satisfactorily done so as to meet the requirements of large towns as well as those of the country. He believed that towns would always find a difficulty in dealing with the question, as they had a tendency to accumulate all the good things of the earth in a very small compass. The question of the distribution of town sewage for purposes of irrigation was really only one of providing a pipe to convey it and of finding land to receive it, and had been very satisfactorily solved by our practical friends the Germans. The whole city of Berlin had been sewered by English engineers, Messrs. Aird, with the result, as he (the speaker) had stated in the *Times* recently, in a short letter, that it only cost 60*l.* an acre to buy land and provide pipes and working plant. It really was a severe comment upon the wealth and the power of Great Britain to find that the Prussians should be so far in advance of us that not only was their metropolis better supplied with water, but that its sewage was utilised while we were only talking about doing it. At Dantzig, again, Mr. Aird had for over seven years been utilising the sewage of the town by irrigation, and he had just contracted with the town of Breslau, with 260,000 inhabitants, to receive its sewage and put it upon the land as a profitable investment. Mr. Aird informed him that the German towns generally were coming to the conclusion that they must shortly utilise their sewage. The Germans certainly possessed one advantage in the fact that the land was poor and sandy, and could be purchased at a low price, but the fact remained that sewage could be profitably disposed of by irrigation, the crops on the sewage-irrigated poor land being much larger and better than the crops obtained on the richest land without sewage. A great deal had been said of the difficulty of dealing with the sewage of our great metropolis, but he had no hesitation in saying that engineers and scientific men would make child's-play of taking the sewage of London and diffusing it over the surrounding country, only give them the money. As compared with the vast sums of money which had been raised for great railway constructions, the money required for carrying out the works necessary for profitably applying the sewage to the land was a mere "fleabite," and it surprised him that so much discussion had been wasted upon it of late years. The Metropolitan Board of Works, some years ago, let the whole of the sewage north of the Thames to a company for fifty years, and the works necessary for applying it to the land were to be completed within nine years from the date of the agreement. As some evidence of good faith, the company lodged 25,000*l.* with the Board, and the Board still retained the money, because the company was unable to fulfil its engagements, which were perfectly practicable, though the public appeared to think differently, and refused to subscribe the necessary two millions of capital. Since the completion of the Metropolitan Main Drainage system, the voidances of four millions of people had not only been lost to the country, but they had gone to obstruct and poison the Thames. It was not possible to discharge into any reasonable river the riddances of four millions of people without causing a great nuisance, and even if it were possible to do so, the sewage would be wasted and misapplied. It had been abundantly proved, over and over again, that when sewage was applied to the land under proper conditions, the results were all that could be desired. For many years he had himself utilised the sewage of his house and farm-buildings, distributing it over the land by means of irrigation, and it was astonishing to find what could be done with the sewage of even a single house. Advocates of the "separate" system, and many farmers, had objected that, under ordinary circumstances, they got too much water with their sewage, owing to the rain or storm-waters not being separated from the sewage strictly so called, but he (the speaker) should be able to show that such an objection was not well founded. Naturally, the manurial power of Great Britain was equal to about two sheep per acre per annum. Reduced to sheep, taking bullocks, pigs, and so on, it would represent 94,000,000 of sheep, or two to the acre. Now it was complained that the London sewage was too much diluted; but how much more water was mixed with the voidances of the two sheep per acre of the country would be seen when he stated that we had a rainfall in this country of 26 in., or 2,600 tons per acre. On the other hand, each human being residing in a town (and for manurial purposes a sheep was about equal to a man) had only about 60 tons of water per annum mixed with his sewage, independently of the storm water, and as Mr. Haywood had shown, we did not have more than about twenty-one severe storms in a year. At all events, the quantity of water following the voidances of two individuals in a town was infinitely smaller than that which accrued to the voidances of two sheep on a farm. As to the execution of the necessary works, he thought that it was the duty of municipal authorities to take care that the sewage of their towns went back to the land, and that if they failed to fulfil that duty the Government should, by Act of Parliament, compel them to fulfil it. There had hitherto been too much indifference as to the question. In London itself it seemed as though the Metropolitan Board of Works was afraid to meet the question. No doubt a great initial mistake had been made in casting the sewage into the river, but it was believed at the time, and no doubt honestly believed, that it would be carried down to the sea, no more to return, but the result had proved that the upward flow was stronger than the downward flow. The Board had lately been down the river and taken samples of the water, which, it was stated, had no offensive smell, and was very clear, even in the neighbourhood of the sewage outfalls. Such tests were worth nothing, for it was impossible that the water which received the manurial voidances of four millions of people in the course of twenty-four hours could fail to be laden with impurity. He regretted the money loss which the waste of sewage for so many years had entailed, and he also regretted the unwillingness of people to discuss the subject, for undue reticence in discussion had hindered progress. He was of opinion with the Chinese, that the first lesson a child should be taught, when he could under-

stand anything at all, was that on his care in the application of his voidances to the soil depended his future existence. The Chinese people had long ago learned that lesson, and the consequence was that a population of four hundred millions of people contrived to maintain themselves without any foreign importations, either of food or manure. Some people were old enough to recollect that at one time, after twelve o'clock at night in London, there were certain unpleasant smells now and again observable, caused by the operations of "nightmen," who emptied the cesspools then in use, and carefully carried their contents to the land,—the proper place for the disposal of all such refuse. It was a remarkable and significant fact, that since London had been sewered, and everything carried into the river, the production of the land of the surrounding country had greatly diminished. His late friend, Baron Liebig, considered it an act of insanity, almost amounting to suicide, to waste our night-soil by throwing it into the river, and then to go to Peru and buy birds' excrement to put upon our land. He hoped that the good sense of the people would remedy this state of things. Practically there was no difficulty in profitably utilising sewage. If the land received the sewage, it must be improved in annual value and rental, and it very often was so to the extent sometimes of 200 or 300 per cent. Mr. Birch had contributed a very able and valuable paper to the "Transactions" of the Institution.

Colonel Haywood, Engineer to the City Commissioners of Sewers, said that many years ago he had some share, in a subordinate capacity, in the preparation of the scheme for the main drainage of the northern part of the metropolis, but since that time he had had nothing to do with the treatment of the sewage of the metropolis in its larger sense, although he had had a great deal of the detail of sewerage works constantly before him. When the present metropolitan main drainage and interception scheme was planned, it had but one object,—how to get rid of a nuisance then existing in the midst of the metropolis, and to cast it forth elsewhere, he would not say regardless of consequences, but leaving the consequences to those who were to be the recipients of the sewage. At that time the population of London was not much more than half of what it was at present. He did not wish to cast a single stone at a work in which he had himself participated, and he was not sure that, in the then-existing state of knowledge with regard to the subject, the Metropolitan Board of Works did not do a wise thing in relieving the heart of the metropolis of the sewage. But the population of the metropolis had nearly doubled since then, and he was afraid that the results showed that even by casting the sewage into the river as low down as Barking, the state of the river would get worse and worse as the metropolis continued to increase. The rate of increase in the population of the metropolis since 1801 had been such that if it continued the population would double itself in thirty-nine years and a half from the present time,—say in forty years. Now, the quantity of water coming down from the upper Thames forty years hence would not, he thought, be materially increased, but, on the other hand, the quantity of sewage would be doubled. If, therefore, the casting of the sewage into the river was now felt to be an evil, what would it be forty years hence? Apart from the food aspect of the question, he looked upon it as one of getting rid of a nuisance, and he came to the conclusion that although the Metropolitan Board of Works might have been wise twenty years ago, — as wise as they could have been expected to be in their generation, — the time had come when their work would have to be reconsidered and different provision made for dealing with the sewage of the metropolis. He did not believe that the metropolis would go on increasing indefinitely, and doubling itself every forty years, but whether or not, the time would come when those who dwelt on the Thames below London would not submit to have the sewage of the great city cast into the river. The sewerage system now in vogue had engaged his study and attention for the last thirty-three years. Full twenty years ago he came to the conclusion that the whole system was an error, and he thought so still. Wherever the water-closet system had prevailed, there arose the difficulty of the pollution of the streams, and where that had been avoided by precipitation, or irrigation it had been alleged that the works were a nuisance. He was of opinion that we must go back to elementary principles, and restore to the land that which had been taken from it. In other words, the sewage must go upon the land. Whether it should go upon the land in the shape in which it left the human animal, or whether it should be diluted with thirty pails of water, was a question. For his own part he believed the whole water-closet system to be wrong, and he thought the time would come when the chemist, coming to the aid of the engineer and the sanitarian, would find a means of deodorising and rendering perfectly innocuous that which was now carried away by the water-closet system, without destroying its fertilising elements, and therefore without destroying its value to the agriculturist. Wherever the water-closet system was in operation, the human excreta were mixed with thirty pails of water per head, and the question was how to get rid of such a large quantity of sewage. By almost a concensus of opinion among the local authorities who had dealt with the question, the bestowal of the sewage upon the land was the most approved method, but it was quite possible to render sewage harmless by means of precipitation, provided chemicals of sufficient value were used, and then to turn it into the nearest watercourse, although even then it would be necessary to let the effluent pass over land before entering the stream.

Mr. Alderman Kempson, of Leicester, said that in that town the sewage difficulty had engaged the attention of the authorities for many years, and it was not yet solved. They had, however, lately resolved to lay down a complete system of storm-water sewers. Hitherto the storm-waters had always passed into the sewers, and as the outfall was considerably below the bed of the river, great difficulties had at times occurred. The storm-water being eliminated, the sewage was of course considerably diminished in quantity, and, consequently, there was less difficulty in utilising it upon the land. Much less land would be required, and that was an especial advantage in some districts, where land was exceedingly valuable. Mr. Mechi had argued that the mixing of the storm-waters with the sewage would not be so prejudicial in diluting the sewage as was sometimes supposed; but the figures he had quoted embraced the whole area of the country. Of course, if the whole of the sewage of the country could be distributed over the whole surface of the country, the question would wear a different aspect. At present, the sewage of a large town had to be provided for within a limited area. Farmers were glad to have the sewage if they could have it when they wanted it, and in the quantities they required. As to the management of sewage farms, they must be conducted on commercial principles, and as a rule corporations and local boards could not manage them so as to yield a profit. To make them succeed they required very close and keen personal management.

Mr. Sedgwick said that in Watford the sewage question had been satisfactorily solved, chiefly, he believed, because the storm-water was separated from the sewage, and the sewage put upon the land by irrigation over thirty acres of land; and, last year, the loss on the working of the farm, after paying expenses of management, interest on loan, &c., was only 100*l*. That was not much to pay by a town of 8,000 inhabitants.

Mr. Bailey Denton, jun., said that at Hitchin, where the storm-waters were mixed with the sewage, the sewage-farm was a failure; while at Abingdon, where the storm-waters were separated almost entirely from the real sewage, the farm was a success.

Mr. McKie, of Carlisle, said that perhaps the oldest irrigation works were those at Edinburgh, but he was not aware that the separate system was in operation there. He did not mean to say that the separate system was not a good thing in itself, but how was it to be carried out? The water that came off many of our streets was charged with manurial matter, and was as much sewage as that which came from the houses, and, therefore, he contended that street drainage should go into the sewers. In Carlisle for fifteen years past the sewage of the town had been put upon sixty acres of land. There was no separate system there. The sewage and storm-water all went on to the land. Certainly there could be no better land in the kingdom for the purpose,—it was a beautiful loamy subsoil, well drained, with gravel under it. There had never been any complaint of a nuisance, and the value of the land had been doubled. No "fermenting pots" in the shape of storage tanks were used. Such things were to be strongly deprecated. The sewage should pass direct from the sewers on to the land.

Mr. Birch, in replying upon the discussion, said that Col. Jones had hinted that he (the speaker) did not "go in" for the "separate" system with sufficient enthusiasm, but he thought engineers ought to be very guarded in condemning the combined system. He agreed with Mr. Mechi in thinking that the extent to which sewage was diluted by storm-water was not excessive, and that such dilution would not prevent farmers from using the sewage. In Devonshire, Dorsetshire, Hampshire, and perhaps in some other counties, water which did not contain any impurity was largely used by farmers for irrigation. The great difficulty caused by admitting the storm-waters into the sewers was the irregularity in the quantity. Col. Haywood had referred to the people who alleged that sewage-farms were nuisances, but they were few in number, if any. The real opponents and obstructives were the people who said "You are going to cause a nuisance," and who thus often prevented works from being carried into execution. As to street-water, even if it were possible to keep the whole of it out of the sewers, it would be exceedingly undesirable to do so. On the other hand, it was a very common objection to the separate system to say that it involved double the cost of the ordinary system, but that was not the case, nor anything like it, for in most places where the combined system was in operation a mile or two of large and costly outfall sewer was necessary in order to take the storm-water away.

The Chairman, in closing the discussion, said that it was gratifying to see that the sewage question, though it moved slowly, was moving in a settled direction. There now seemed to be perfect unanimity that the proper way in which to dispose of sewage was to put it upon the land. There were, of course, differences as to details, but these would to a great extent be self-adjusting. Mr. Haywood had referred to the quantity of water likely to be found in the upper Thames forty years hence. Unless the London water companies did something before then, there would be little or no water left in the Thames at Richmond, Brentford, and other places.

FIRE AND PANIC PROOF BUILDING CONSTRUCTION, FOR THEATRES AND PUBLIC BUILDINGS.

The following is a short description of an invention to render theatres fire and panic proof, submitted to the Lord Chamberlain, with sketches, by Mr. T. C. Ebdy, architect. It is, at any rate, suggestive:—

Suggestions for a Theatre or other Building to be Proof against Fire, and afford easy Escape from Galleries, Boxes, and Pit, without Danger in Case of Panic.

The whole of the walls and piers to be built of brick, concrete, or stone. Boxes, galleries, and roof to be supported upon iron columns, and the roof formed with box-iron girders, and the floors with rolled joists.

The roof to be flat, with intermediate rolled-iron joists and hoop-iron, and rendered in one mass with Portland cement concrete, so as to form a tank to contain a depth of 2 ft. of water over the entire area of the building. This water to have free circulation through all the iron framing of the roof, and flow and return from the roof to the pit-floor through the supporting iron columns and stand-pipes; the water to be used as a motive power for raising or lowering the pit-floor every day for cleaning the house, by this means the water would be continually circulated from roof to floor, and so kept fresh (or run off and replaced when necessary).

I propose to construct the pit-floor upon an incline with the end adjoining the lobby entrance, to rise 5 ft. 6 in. from the orchestra to the front end of the boxes, the whole of the floor to be constructed upon truss beams, and rolled iron joists, and so framed as to be fixed or hung at the stage end, and be raised by water-power from the roof at the lobby end when the house is empty, the audience being admitted in the usual way. In case of panic, the floor could be lowered in a few seconds to the level of the lobby-floor, having a clear headway under the boxes of 5 ft. 6 in. or

5 ft. 10 in., the full width of the end of the house, and the same motion would open all the front doors in coil the same width, so that the audience could pass out *en masse* with ease and comfort.

To relieve the galleries and box staircases from crowding on each side of the house, the full length between the ceiling and the roof (out of sight), and the full width of the end of the house over the galleries, I propose to introduce revolving cylinders, with wire-rope ladders coiled round the cylinders, say, every 6 ft. in the length of each side and end, having a continuous guy-rope attached to each ladder throughout, and properly weighted.

Balanced guide-ropes to pass down the sides of the galleries and boxes; and in case of panic the audience could, by pulling these ropes, unroll the ladders throughout the house, the guide-ropes being continuous, and roll upon the cylinders, and so secure the bottom of the ladders at the floor-level, thus giving a temporary stair every 6 ft. to the galleries and boxes in all parts of the house to pit floor-level: by this means the house could be cleared without danger in a few minutes by descending the ladders. In existing houses, where the cylinders could not be constructed for want of space, between the ceiling and roof wire-ropes could be attached over the galleries and boxes in the same way, at short distances, and suspended to the centre of the ceiling with a slip-ring to be used in case of need from the side of the stage. These ropes or ladders would fall against the front of the galleries, &c., in every part of the house at one time, being kept clear of the floor, say 6 ft., to pass over the heads of the people in the pit, would form an easy means of descent.

The ropes, if gilded and crossed, would form a decorative feature. The ceiling to be composed of iron or copper-wire gauze stretched upon frames, and fit between the box-girders, having a free ventilating space between the ceiling and the roof (or water-cistern), formed in patterns or panels and decorated with colours mixed with liquid glue (no oil or spirits being used): this ceiling would look solid under such treatment.

The front of galleries and boxes being covered with similar material upon iron frames.

The drop-scene to be made of wire-gauze or steel ribbons, and let down in a fold to form a fire-door, and the wings and sets to be of the same material. Should plaster be used in any part, to be rendered upon wire netting.

The seats to be made of enamelled iron in colours burnt in. All curtains and cushions made of fireproof fabric.

The weight of water in the roof-tank and a hydraulic pump would raise the pit-floor by the power of one man to the required height, the pipe-valves being self-closing; it only remains to turn a valve-cock or lever, and the water would pass through the stand-pipes and return to the roof, the floor falling to the level of the lobby by its own weight.

The whole of the iron construction to be prepared by the dry steam process, so as to be impervious to rust.

The valve-cock or motor might be placed in front of the drop-scene under the control of the stage-carpenter or actors, or by the audience, in case of panic, by getting on the stage from the pit or boxes. A second handle or lever above the last being released from a catch would set the cylinders in motion and uncoil or let down the panic-ladders or ropes extending from ceiling to floor within easy reach of front of gallery and elevated sittings.

A house so constructed could not be set on fire under any circumstances.

Iron, when subject to heat, expands, and in case of intense fire distorts, fractures, and becomes useless as a constructive material; but when filled with water, as in this case, becomes an undamageable constructive substance of infinite value. On the principle, if a kettle be placed on a fire without water, it becomes a total wreck upon superheating,—filled with water, indestructible, and may be taken from the fire at boiling-point and placed upon the naked hand without burning or being uncomfortable to handle, which at once proves that iron unprotected by water is useless as a constructive element,—filled with water, proof against fire in any mass or form. Timber should not be use in any part of the construction, or any other unprotected combustible.

All floors to be executed in concrete or other similar material.

NEW BUILDING BYE-LAWS FOR LONDON,

UNDER 41 AND 42 VICT., CH. 32.*

PARAGRAPH VI. [of section No. 2, of the suggested bye-laws]:—"Every wall of a house or building shall have a damp course throughout its whole thickness, of asphalte, or other material impervious to moisture, at a height of 1 ft. above the base of such wall where there is no basement story, and at a height of 1 ft. above the level of the ground where there is a basement or half-basement story."

a. It would seem desirable to insert a paragraph before No. 6, dealing with the walls of rooms which are situated, wholly or in part, below the surfaces of the footways of streets, or below the general ground level. By section 103 of the Metropolitan Local Management Act (1855), underground dwelling-rooms must have "an area not less than 3 ft. wide in every part, from 6 in. below the floor of such room or cellar to the surface or level of the ground adjoining to the front, back, or external side thereof, and extending the full length of such side"; and the City of London Sewers Act (1851) stipulates for the same kind of area, with one or two trifling differences,—"outside or adjoining the same vault or cellar, and extending along the entire frontage thereof." But there is no power given to any one as yet, which would help to keep walls,—other than front walls,—dry. How would such a clause as this work? "Underground dwelling-rooms shall have the walls, with which earth is in contact, protected against damp by the application (either to the external or the internal surfaces, or within the substance of the walls) of asphalte, or other efficient protective coating; or such walls may be built in two thicknesses with a cavity between them, the two thicknesses being tied together in a manner approved by the district surveyor." The bye-law is to be made (sec. 16 of the Act) "to serve purposes of health." It will hardly do so to any good purpose if underground dwelling-rooms, which deserve a good deal of control, are not improved for the future.

b. If such a provision as this were made, it would then be sufficient to provide that the damp course shall not be placed *above* the level of the lowest floor. It would be quite in the discretion of any one, who had no underground rooms, to drop the damp-course to a lower level if he chose.

Paragraph 6 would thus be:—"Every wall of a house or building shall have a damp-course throughout its whole thickness. The damp-course shall be of some material impervious to moisture, and shall not be placed above the floor-level of the lowest story of such house or building."

Paragraph VII.—"The top of every party-wall and parapet-wall shall be finished with one course of hard, well-burnt bricks set on edge, in cement, or by a coping of any other waterproof and fire-resisting material, properly secured."

A. Is not the word "waterproof" new, used in reference to building materials? If so, it is undesirable for that reason alone; besides the purpose of its insertion can be secured in another way. "Fire-resisting" seems a still worse word, for it is in use and is coming still more into use for hard woods, and all materials which, though not incombustible, do not readily take fire. Let other doubts be implied by a suggested paragraph:—"The top of every party-wall, and the top of every parapet, shall be finished with a coping of some hard and incombustible substance, properly secured. The coping shall project on each side from the face of the wall, and be throated on each side; or a creasing laid in cement shall be put under the coping." A coping is "the highest and covering course of masonry *or brickwork* in a wall."—Gwilt and common use.

Might not the heading of section 2 follow with advantage the form of the heading of section 1? It might be shortened also, and thus consist of the simple words,—"As to walls." The heading as it stands,—"Description and quality of the substances of walls,"—in the suggested bye-laws, has been copied from clause 2 of the 16th section of the 1878 Act. Still it is anything but happy in wording now; and would be still less so if all the provisions as to walls should be set out together, as suggested on page 1249.

The heading of section 1, "As to foundations and sites of buildings," might, by-the-bye, deserve reconsideration also. The "of buildings" at the end is not desirable. It is incorrect; as a distinction is made throughout the bye-laws between houses, buildings, and other erections.

C.

* See pp. 1231, 1249, *ante*.

HEALTHY HOUSES.

AT the Working Men's College, Great Ormond-street, which was founded by the late Rev. F. D. Maurice, a series of free popular lectures are now being given to men and women, and they are well attended. Professor Tyndall presided at the fourth of the series, which was delivered on Thursday, the 28th ult., the lecturer being Dr. Corfield, Professor of Hygiene at the University College, who took for his subject "Healthy Houses." The lecturer gave very useful advice on several points, but nothing that our readers have not heard fifty times.

Professor Tyndall, who was warmly received, proposed a vote of thanks to the lecturer, remarking that the lecture had been interesting, straightforward, and practical, and was certainly calculated to instruct those who were interested in such matters. In the first place, Professor Corfield spoke of the necessity of having a dry basement, and then went on to consider the state of the air, and gave them many valuable hints in regard to the supply of pure air for the benefit of health. In all his remarks he (Professor Tyndall) heartily concurred. In respect to the communication between the cistern and the waste-pipe, that was a question of extreme importance. Bad-smelling air, which, however, was not always the most dangerous, was an indication that air was coming into the house from a dangerous source, and in that sense the bad smell was a good thing. The poison of typhoid fever was mechanically suspended in the air of the drain, and when it was allowed to enter the house it sowed itself, so to speak, in the human body, producing that terrible scourge typhoid fever. That was one of the most important points to which their attention had been drawn. He could heartily sympathise with the lecturer in respect to those "chattering ventilators." To a studious man, they were a most diabolic invention, and made a noise when least expected. For his own part he always drew the valve when he studied, and did not let the ventilator open at all.

The motion was agreed to, and, on the proposal of Mr. Bickersteth, a vote of thanks was also passed to Professor Tyndall for presiding.

PUBLIC WORKS AT BARROW.

THE NEW DOCKS.

NOTWITHSTANDING the great depression of trade which prevails throughout the country, works of an important character are actively proceeding at the new and rising town and port of Barrow-in-Furness, whilst others are projected. Extensive new docks, in addition to the Buccleugh and the Devonshire docks (two of the largest docks in the kingdom), have for some time been in progress, consisting of the Ramsden dock, 100 acres in extent, together with a tidal basin of 9½ acres, and a lock 900 ft. in length, the two last-named having been completed and now ready for opening. Beyond this, spacious berths for large ocean steamers which will shortly commence running between Barrow and the American ports, are in course of construction, and fast approaching completion, whilst the works at the large Ramsden dock of 100 acres in extent, are in a forward state, most of the excavation work having been effected, and the construction of the dock walls commenced. When the works are completed, ocean ships of the very largest size will be able to enter the harbour and docks, as the channel of the river is being dredged to the depth of the Ramsden dock, whilst Peel Bar, at the entrance of the harbour, is being dredged to a similar depth, which will secure a uniform depth of 30 ft. at high water, thus giving greater facilities for the entrance of vessels of larger tonnage than are possessed at Liverpool and other ports. It is expected that the new docks will be opened for shipping in spring.

Another project which has just been brought forward is the construction of steam tramways in the main thoroughfares of the borough, and the principal street of the town, which is planted with trees on each side, is at present being constructed at such a gradient as to allow steam tram-cars to be worked upon it. It is stated

that in order to carry out this project the Furness Railway Company are about to apply for Parliamentary power.

THE WINDSOR COLLECTION OF DRAWINGS BY THE OLD MASTERS.

It is good news that Her Majesty the Queen has been pleased to accord her permission for the publication, in fac-simile, of a series of reproductions from the noble collection of drawings in the Royal Library at Windsor, as recently exhibited at the Grosvenor Gallery.

Sir Coutts Lindsay justly believes such a publication will be cordially welcomed as a substantial contribution to the materials of artistic study, and as offering invaluable models to the students of the various art-schools throughout the country, and he has decided to take advantage of Her Majesty's gracious permission, and to issue forthwith a series of faithful reproductions from the drawings of Leonardo da Vinci, Raffaelle, and Michelangelo, to be followed by works of other masters of the Early Italian, German, and French schools. The drawings have been selected under the personal supervision of Mr. Richard Holmes, F.S.A., Her Majesty's Librarian at Windsor, and they have been reproduced by Mr. Stephen Thompson, by means of the autotype permanent process.

The entire publication will, of course, be expensive, but will be divided for the convenience of those who may be unable to subscribe for a complete series. We trust the publication will be a success financially; in other respects there can be no question.

THE PROPOSED NEW TOWN-HALL AT READING.

The subject of a new town-hall and free library for Reading has for some time been before the inhabitants and the local authorities, and two plans have been under consideration, but in consequence of a proposal to expend 60,000*l.* on a building larger than that originally contemplated, it was feared that the entire project would collapse. It is now, however, proposed that instead of the larger project in its entirety being carried out at present, the sum of 40,000*l.* shall now be expended as originally intended, rather that the 60,000*l.*, the estimated cost of the more comprehensive scheme, and that the additions be postponed to a future period. It is stated that up to the present time more than 20,000*l.* have been raised in subscriptions, which, it is understood, can be raised to 30,000*l.* if the Corporation will guarantee the remaining 10,000*l.*

GARWAY, HEREFORDSHIRE.

This interesting church is now undergoing a gradual process of repair and restoration. The first instalment of the works being completed, the Bishop of Hereford, accompanied by the Archdeacon (Lord Saye and Sele) attended the re-opening services on the 8th ult. The greater portion of the building dates from the commencement of the fourteenth century, though there are not wanting evidences of both Norman and Perpendicular times. The Knights Templars resided at a preceptory close by, so it is inferred that a good deal of the work is due to their skill and energy; indeed, internal corroborative evidence exists of this in the position and size of the tower, which is 27 ft. square, and placed about 10 ft. away from the north-west corner of the nave, as well as in several of the ornamental features of the interior, notably in the richly-sculptured chancel arch.

The following may be taken as a sample of the work already done. A heavy gallery, extending across the west end of the nave, and along the greater part of the north wal,l has been removed, revealing a three-light window. A wall between the chancel and chapel has also been taken down, thus showing to full advantage a beautiful specimen of fourteenth-century arcading. The old oak benches, with ends 4 in. in thickness, have been refixed on a wooden platform, and by a simple alteration made comfortable enough for nineteenth-century worship. The old altar-slab, with its five incised crosses, which was found face downwards amongst the old paving of the church, has been placed again in its original position. The carved oak rood-loft has long since disappeared, but the flight of steps and raised gangway leading to it extending along the whole length of the north chancel wall, are fortunately intact, while the original doorway has now been opened out.

The work has been executed by Mr. W. Balcombe, of Kenilworth, under the superintendence of Mr. E. H. Lingen-Barker.

THE BERMONDSEY NEW VESTRY HALL

After having had the subject several times under discussion, the Bermondsey Vestry have at length come to a final decision as to the erection of a new vestry-hall. At their meeting, held last week, the advisability of giving instructions for the erection of a vestry-hall, offices, and public hall for the parish, the estimated cost of which is 20,000*l.*, was taken into consideration. It was moved by Mr. Morgan that the necessary steps be taken at once. He observed that the want of a public hall, as well as a vestry-hall and offices, was very much required in the parish, the necessity for this improvement being constantly brought under their notice. Dr. Preston, who seconded the motion, in proof of the necessity for the new building, pointed out that the parish, which contained 100,000 inhabitants, was without any adequate public hall, a circumstance that was not to be found in any small town. Objection was taken by one or two members of the Vestry that it was very inopportune to proceed to so large an expenditure as 20,000*l.* at the present time, especially as the ratepayers had not been consulted, and they expressed a hope that in these bad times the Vestry would not go on with the project. The great majority of the members were, however, in favour of the proposal, which was adopted, and it was resolved that steps be taken for obtaining designs for the building.

GREAT SALE OF MESSRS. M'LAREN & CO.'S EFFECTS.

One of the disastrous results of the failure of the City of Glasgow Bank has been exemplified during the present week in the sale of the stock and plant of Messrs. Andrew M'Laren & Co., of Thames-street, the extensive ironfounders and contractors in connexion with buildings. The firm, which is one of the largest of its kind in the metropolis, has for several years past been well known amongst builders and others, having supplied the iron-work and machinery to many public establishments, including the spacious new infirmary at Lambeth, which was recently opened. The firm, which was in the midst of an extensive and well-established business, has been compelled to go into liquidation in consequence of the collapse of the City of Glasgow Bank. The sale includes the whole of their immense stock of ironmongery, and articles connected with building, at the show-rooms and general business premises in Thames-street, as well as the plant and machinery at their manufactory at Bankside and elsewhere, and will last several days. The firm has hitherto employed upwards of 400 artisans, who are thrown out of work by the disaster.

COMPETITIONS AS A GOOD.

Sir,—It is with great diffidence that I venture to address you upon a subject,—that of competitions,—on which at the opening meeting of the Royal Institute of British Architects, the president has spoken with all the weight of his authority and experience.

But, sir, there is another light in which I would ask permission to place the subject before your readers.

All architects will cordially agree with the president that the present condition of things is deplorable, wasteful, and vexatious, and it may be that we ourselves are partly to blame in maintaining it; but, I think, few at least of the younger ones will agree with him as to the remedy he proposes, that, avoiding competitions, they should be content with "patient, quiet, and even unknown good work," until "recognised by their seniors," as a course involving no disappointment and *only* delay. The delay in itself would be sufficiently serious, and even ruinous in many cases, but after the delay are the seniors in the profession ready to recognise their juniors, who are actually their competitors, or to lend them a helping hand? Or is it by the seniors that the juniors would wish to be recognised? Would they not rather be recognised and *patronised* by the public? And are not competitions, if honestly conducted, one of their readiest means of appearing before the public?

It is true this patient, quiet, good work will improve and ripen the powers of young architects; but so, on the other hand, will competition work, though, of course, to a smaller extent.

Architects would, no doubt, be very glad if competitions could be abolished entirely, if each one could have his fair share of the work to be done; but we must not forget the Scripture rule, that "to him that hath shall be given,"—a rule which may, perhaps, be applied more literally to our profession than to any other, and the effect of which would be that only the senior and best-known men would get work,—an instance of which is given by the President himself relative to the Hove Town-hall.

What appears to me to be wanted is, that competitions should be fairly and honestly conducted, and that it should be generally understood that architects would not compete in any unless the conditions were in accordance with general rules drawn up or approved, and made publicly known, by the Council of the Royal Institute.

Such disgraceful conditions as we now occasionally see laid down for competitions would then be no longer offered, or, if offered, would very properly be left by all respectable members of the profession for those who wish to "run before they can walk."

T. N. L.

Sir,—I think it will be admitted by the majority of the profession, or, at least by its younger members, that the president's remarks on competition in his opening address do not represent the views generally held on this subject. It is all very well for those members of the profession who are established on their lofty perches to look down on their younger brethren, and tell them that "quiet labour" succeeds better than trying to "run before they can walk." If committees are to select from names instead of from drawings, it simply means that well-known and established architects will get all the work, and young men, no matter how clever they may be, will go to the wall. We are asked to think that nothing is gained by competition; still, how can we shut our eyes to the fact that the Manchester Assize Courts and Town-hall, also the Midland Hotel, Albert Memorial, and Hamburg Church, were won in this way? And he must be a bold man indeed who will deny that the architects of these buildings have gained nothing by competition. The architect of the Criterion Restaurant has more than a little, I fancy, to be thankful for under this head: so that competitions, if properly conducted, are not such very terrible things. Our president closed his address by asking whether the action of the Institute was to be "active or passive." I trust it will be the former, and that this most vital question of competitions will not be burked, but will receive the attention which is its due; and I say it is the solemn duty of the Institute to take the matter up, and endeavour to get a law passed which shall prevent its members from gambling away their very life-blood.

W. Galsworthy Davie.

THE "TECHNIQUE" OF PAINTING.

"Meter" on the "Future of Art" has touched some vital points on the "Technique" of painting. The question naturally arises, with the possession of new and beautiful colours, and prismatic and other scientific theories for the harmonic production of colour arrangement, how is it that modern painting is so wanting in many of the excellent qualities possessed by the old masters? One plain answer may be given. They are not such good mechanical workmen, for then the artist prepared his own canvas or panel, ground his own colours, and sometimes made them, and manufactured his vehicle, and, consequently, understood their nature and properties; but now he takes just what the colourman thinks best for the artist or his own profit, not knowing or caring whether the colours will from the poor preparation sink into the ground or disappear altogether in the course of time; neither the one nor the other asking any questions for conscience sake.

Reynolds and Gainsborough, two of England's great colourists, were both ignorant of the "Technique" of painting. Reynolds is said

to have destroyed a valuable Titian in order if possible to discover the process and vehicle employed by the great Venetian painters; but he did not succeed, we well know. Had he even possessed the mechanical knowledge of an ordinary house-painter, he would not have done the foolish things attributed to him, such as painting distemper on an oil ground, then using varnish, and still further repeating the process, or of using, as he certainly did, large quantities of wax and varnish, which naturally contracted by the influence of time, causing great cracks into which the little finger might be laid. His whole art career as to paint and colours may be said to be a great and continued experiment; he discovered much as to ground preparation, but never became possessed of the proper vehicle for finishing. Hence, what might have become beautiful pictures are rendered next to valueless, unless it be to point to future artists what they ought not to do.

Then with regard to Gainsborough, he did not aim at discovering the Venetian method, but was content to adopt the Dutch and Flemish system by painting transparently on a white or light ground instead of a solid preparation. Though different in process, the two were nearly identical in principle. But he being dependent on the colourman, never had a hard or rightly prepared ground, such as the Dutch used, nor had he like them the rich transparent vehicle: hence too many of his otherwise beautiful pictures appear dark, thin, and washy. It is not so in the old masters. Titian, though solid, is rich, brilliant, and permanent in colour; and Veronese is pure and brilliant to this day; and Correggio, with his solid *impasto*, is transparently clear, constituting the very perfection of paint. Compare much modern work with such. Look at the Continental ideal of paint, too often bearing the appearance of mortar put on with a trowel, under the false notion of representing the solidity of nature, and, unfortunately, this pernicious style has its imitators amongst talented English artists.

I trust I may not be deemed presumptuous in now stating I consider myself to be in possession of the vehicle used by the Venetian and Dutch painters. It is not by mere accident, for the search for it extends over a period of thirty-five years; and about a year and a half ago I felt justified in using the words of the Greek philosopher,—"I have found it"; and it is only in consequence of being engaged up to the present moment in other pursuits that I have been prevented from announcing the fact. But the letter of "Meter" has compelled me to break silence. I may now be permitted to say, further, that the first efforts, done a year and a half ago, retain the same lustrous transparency, or nearly so, as they had the day the colours were laid on; and as to all other working qualities requisite for the artist in all the varied kinds of execution, I believe nothing more can be desired. The evidence also that it was a commercial article in use at an early date in art tends to support my conviction that it is what was used by the old masters; and, I believe, in the hands of a Millais or a Leighton and others, modern art in technical qualities would soon vie with anything done in the past.

R. MARTIN.

TECHNICAL EDUCATION.

SIR,—Your correspondent, Mr. Buckmaster, says we occasionally hear of technical education for bricklayers and masons, but what is meant by this technical education is not so clear to the outside public. Now, sir, as I happen to be one of those who initiated the movement which was the origin of the bricklayers' classes, and for a considerable period was one of the principal teachers, I am in a position to enlighten the outside public, and also your correspondent, in respect to the meaning of them. It is meant to teach by the aid of bricklayer teachers, not only all, but more than all, the subjects taught at the drawing-classes, and classes in building construction, as carried on under the auspices of the Science and Art Department, but also what the teachers at these classes are not able to do, "to teach the practical application of them, and other affinitive subjects, to the technical details of all the various phases in the art of bricklaying." Not exactly in the same manner as implied by your correspondent, when he rather sneeringly alludes to the garret at the Artisans' Institute, but by a thoroughly searching explanation of the theory, illustrated by diagram, showing every detail put in actual practice, frequently accompanied by models constructed to scale. By these means the students have had brought home to them, in such a manner as can only be done by one of their own trade, information and knowledge of such a character that possibly not one in a score, nor even one in fifty, could ever hope to obtain during a lifetime spent in the routine of their every-day work, and certainly not at the Science and Art classes as now carried on by teachers who know next to nothing of the practical application of the subjects they teach.

Now, sir, in my simplicity, I cannot help thinking this is the kind of technical education needed, evidenced by the ready way in which the Royal Institute of British Architects kindly lent their name as patrons; also that the president graciously performed the part of chairman at our first distribution of prizes; also that several architects, and more than one City Company, sent donations to the funds. Further, South Kensington itself so far acknowledged the importance of the work being done as to depute an inspector, Mr. J. F. Iselin, to pay a visit to the classes then in operation at the Artisans' Institute; the most important in numbers, and interesting in the manner of the teaching, being the bricklayers' class,—which at that time was in hired lodgings at the Institute. That he was highly pleased at what he saw his report will show.

Thus it will be seen that the classes in question scarcely deserved to be spoken of in the derisive, not to say sneering, manner adopted by Mr. J. C. Buckmaster.

I may add that at the time of Mr. Iselin's report the services of the teachers of the bricklayers' classes,—carried on at the Artisans' Institute, at the Lecture Hall, Greenwich, and at a schoolroom in Chelsea,—were entirely gratuitous, and if, as is quite true, the good work has, for a time at least, come to a stop, it is not from the want of efficiency in the teaching, or from the lack of support, but from the want of harmony in the management.

J. WOODLEY.

CASES UNDER METROPOLITAN BUILDING ACT.

"MORTAR."

A SUMMONS was heard before Mr. Paget at the Hammersmith Police Court, on the 26th ult., which had been taken out by Mr. T. E. Knightley, district surveyor of Hammersmith, against Mr. Isaac Mears, of 8, Burfield-street, Hammersmith, to enforce compliance with the provisions of the Building Act in regard to the mortar being used in the erection of houses in Bassien Park-road, under Mr. Mears's superintendence.

The District Surveyor stated that defendant, in erecting the aforesaid houses, had failed to comply with Section 12, and with Rule 2 of the 1st Schedule of the Act, which required that brickwork be solidly put together with mortar or cement. Instead of using mortar compounded of lime one part, and sand three parts, a very inferior substitute had been used, composed mainly of vegetable soil, slightly charred during the process of burning bricks upon the ground. He had frequently remonstrated with him, and had complained that the good sand, with which the neighbourhood abounds, had been dug out and sent away instead of being used in the buildings. Decided cases on the subject were referred to, Mr. Knightley taking occasion to say he had, after taking immense trouble some time back, succeeded in getting a decision at that court on the question of "Mortar." His assistant, Mr. William Holditch, and some witnesses for the defence, having given evidence,

Mr. Paget said he happened to know what "mortar" was, and how it should be made. It should consist of lime and sand only, mixed with water, and it was clear that defendant's mortar contained other unsuitable ingredients. He should make the order as prayed, for the demolition of the portions complained of, allowing the district surveyor his costs.

FIRE-PROOF DIVISIONS.

Mr. W. Ayres, pawnbroker, of 87, King-street, Hammersmith, was summoned before Mr. Bridge by the same district surveyor, for not constructing a fire-proof floor to his premises.

Mr. Gane appeared for the defendant.

From the evidence it appeared that the defendant formerly occupied the adjoining premises 89, 91, and 93. He now occupied 87 exclusively, and the upper portions of 89 and 91, the shops underneath being let to another person, who held and resided in 93. As the defendant had access from the first house to the upper portions of 89 and 91, Mr. Knightley required him to construct a horizontal fire-proof division to the latter-mentioned premises.

Mr. Knightley said there was such a change in the occupation of the premises as brought them within the mischief contemplated by the Act. He measured the whole four houses, the superficial square feet exceeding 3,600, mentioned in the section.

Mr. Gane said it was a most important matter to the defendant, for if the order were made he would have to pull the four houses down. He argued that the Act did not apply to old houses.

Mr. Bridge said the question was whether they were chambers or rooms. He held that as 93 was in the exclusive occupation of another person, it did not form a portion of the same premises, which would then be under 3,600 superficial square feet.

The District Surveyor said he could not withdraw the case, which was now before the Metropolitan Board of Works. He submitted that 93 must be included in the measurement, as there was the danger of a fire extending to the shop.

Mr. Bridge dismissed the summons, and granted a case for the opinion of a Superior Court.

SETTING ASIDE AN AWARD.

RE THE CORPORATION OF BIRMINGHAM *v.* THE WEST BROMWICH IMPROVEMENT COMMISSIONERS.

THIS was an application, in the Queen's Bench, on the part of the Corporation of Birmingham to set aside an award made by Sir H. Hunt, C.B., as to the amount of compensation to be paid to the Corporation by various local bodies in respect of the transfer to them of certain gasworks and other undertakings vested in the corporation. By the Act, the amount was to be settled by arbitration, and the principle of valuation adopted in the case of the first local body applying to purchase was to govern the subsequent arbitrations. A claim being made by the West Bromwich Commissioners for the purchase of a portion of the undertakings, arbitrators were appointed.—Mr. Hawkesley on behalf of the Corporation, and Mr. Bramwell on behalf of the Local Commissioners. They appointed Sir Henry Hunt, C.B., as umpire, and he made an award for the amount of £70,000, which was only £15,000 more than the Commissioners had offered: whereas the Corporation claimed £218,000, and the lowest amount estimated by their witnesses was £70,000. So enormous a difference in the amount of the award excited dissatisfaction on the part of the Corporation, and, in addition, they considered that the umpire had adopted a mode of valuation entirely erroneous, and that the award did not disclose the principle on which the valuation was made. On these grounds,

The Attorney-General (with the Solicitor-General, Mr. Michael, Q.C., and Mr. C. Bowen) moved on Saturday, on the part of the Corporation, for a rule *nisi* to set aside the award, contending that the umpire must have adopted a wrong ground of valuation, and could not have adopted the right one; and at all events, had not disclosed the principle of valuation on which his award was made.

The Court granted a rule *nisi* to set aside the award.

THE DEATH OF THE LATE MR. F. H. ADAMSON.

SIR,—Will you kindly allow me to correct your notice of the above, which attributes the mishap to the failure of a rung in the ladder.

It was not so, the ladder being perfectly sound in every way, and fixed in a thorough workmanlike manner,—a fact unanimously acknowledged by the jury, when they inspected the same. There is no doubt whatever but it was caused by what is technically known as *skidding*.

The unfortunate gentleman was descending the ladder in the usual manner, as invariably practised by persons employed upon building works,—two staves or rungs at each step,—when somehow or other (most likely by the lowermost foot missing its hold) he commenced to skid. He fought with great tenacity to maintain his grip of the sides of the ladder; failing, however, to do so, his fall was certain, which occurred at a height of 15 ft. or 16 ft.

At the inquest held on the body, on Tuesday afternoon, a verdict of accidental death was returned, the coroner and jury expressing themselves satisfied no one was to blame.

THE CLERK OF THE WORKS.

*** We had no intention of imputing blame; and the statement came to us from what we considered unquestionable authority.

COMPETITIONS.

Cocoa Hotel at Blaenau, Festiniog, North Wales.—Fifteen sets of designs were received in the competition for a cocoa hotel, proposed to be built at Blaenau, Festiniog. The board of directors decided on giving the first premium to designs by Mr. C. Jenkin Jones, architect, London; the second, to designs by Mr. J. Humphreys-Jones, architect, Mold; and the third, to designs by Mr. Walker, architect, Liverpool.

The Rous Memorial.—The design of Mr. F. W. Roper, of 9, Adam-street, Adelphi, has been selected by the committee of the Rous Memorial for a cottage hospital and almshouses at Newmarket.

Hotel, Lancaster.—In August last, the Lancaster King's Arms and Royal Hotel Company Limited, having acquired the present Old King's Arms Hotel, and other properties, advertised offering premiums, and inviting architects to send in designs for rebuilding the hotel on a more modern and extensive scale, and for laying out the rest of the estate to the greatest advantage. In response, nineteen architects sent in designs, including one set from France, and after much consideration the company have this week awarded as follows:—First premium, the carrying out of the work to Messrs. Holtom & Connon, architects, Leeds; second, 30*l.*, to Mr. Stephen Shaw, architect, Kendal; and the third, 20*l.*, to Messrs. Hetherington & Oliver, architects, Carlisle. The amount proposed to be expended upon the hotel portion is 6,000*l.* Mr. Austin, of the firm of Paley & Austin, assisted in adjudging the designs.

MASTERS AND MEN.

Belfast.—The master builders of Belfast propose reducing the wages of carpenters from 7½d. to 7d. per hour, and an extension of the town boundary, outside which extra payment is allowed for lodgings and travelling. The reply of the men, about 700 in number, was given on Monday, opposing the boundary extension, and asking the masters to adhere to the former compact, by which it was agreed to give three months' notice of any alteration in the scale of pay. The Belfast stonecutters' wages have been reduced from 8d. to 7½d. per hour, and notice given of another ½d. an hour reduction three months hence.

Crieff.—The wages of the labourers employed by the master builders of Crieff were on Monday reduced from 4½d. to 4d. per hour.

Perth.—On Monday the Perth painters commenced work at a reduction of ½d. per hour, the wages now being 6½d. per hour.

Glasgow.—At the weekly meeting of the Edinburgh operative masons on Monday night, it was reported that the strike amongst the masons in Glasgow had now come to an end, the men having accepted the masters' terms of 7d. per hour.

Edinburgh.—At the usual weekly meeting of the Lodge of the Edinburgh United Operative Masons on Monday night, a letter was (the *Scotsman* believes) read from the Secretary of the Edinburgh and Leith Master Builders' Association, stating that it had been resolved to reduce the rate of wages immediately from 7½d. to 7d. per hour for competent workmen. It was agreed to defer action till a letter specifying the date on which the reduction should take effect had been received from the Masters' Association. This, it may be mentioned, will make a reduction of 2d. per hour on the rate of wages, or 8s. 6d. per week since the month of May.—— A few days ago, a notice signed by the Chairman of the Edinburgh Master Joiners' Association, was issued to the trade, stating that, "owing to the depression of trade, joiners' wages will be reduced to 7d. per hour for competent workmen on and after Monday December 2." This notice was duly posted at the works of a number of firms, including some of the principal establishments in the city. Accordingly, the reduction came into operation in such shops on Monday—the workmen, it is reported, submitting without any further protest than that implied in the resolution adopted at their general meeting on the 29th ult., to the effect that the reduction "is uncalled for and unwarranted, and therefore we agree to resist it as far as possible."

CAUTION AS TO PROPOSED TRAMWAYS.

Sir,—I trust you will allow me to direct the attention of the owners and lessees of house property in the suburbs of London to the numerous notices given of new tramways about to be constructed. Unlike railway companies (who are compelled to give notice through the post to every "owner, lessee, and occupier," along the proposed line), all that is done in the case of a tramway is to publish an advertisement, which nobody reads, and to hang little boards to some of the lampposts along the line of road. Unless unusual vigilance is used, an Act of Parliament may be obtained, and the first intimation many an owner will have will be the appearance of the workmen to carry out a work which when done will probably deprive his house of half its saleable value. It is most unjust that a public road, made and maintained by the ratepayers, should virtually be made a present of to a tramway company, and an ever-increasing nuisance in the shape of "cars," with the eternal "bell accompaniment," be brought upon it, damaging irretrievably the property along the road. Why should not tramway companies be compelled to pay compensation like railway or other companies who take or injure people's private property? It behoves all persons interested in London house-property to be up and doing,—to petition the various vestries and local boards to oppose the Bills promoted in Parliament, to convene meetings; to combine for mutual aid and protection (a "House-owners' Protection Society" might be started with limited liability), and while strenuously opposing the construction of new, to seek to compel the existing tramway companies to discontinue their bells, and to fix them with liability to compensate persons whose property they have injured. No one ever contemplated tramways being laid down as is now proposed nearly all over London. They are becoming simply a public nuisance, and it is clear that when a new tramway is laid in a road, the ordinary traffic is gradually driven off, and the road becomes simply a railway; house-property, in fact, suffers for the benefit of companies, who reap all the profit, and leave the loss to be borne, anyhow, usually by an unhappy lessee. H. W.

ROMAN NUMBERS.

Sir,—Your correspondent, "C. H.," in last week's issue, asks how to add up Roman numerals. It is simply a question of units, tens, and hundreds, as shown below:—

19	.....		X	IX
111	.....	C	X	I
95	.....		XC	V
22	.....		XX	II
			X	
247		(247)	CC	XL VII

The 1 from the first column, 17, must be reckoned as X to be placed in the next column.

J. Gilbert.

Sir,—I send you an answer to "C. H.'s" inquiry. His difficulty arises from not seeing that these figures were merely signs of value. In the Arabic every sign is single; in the Roman the signs are not uncommonly double. Sometimes, as in VIII, four parts constitute the sign.

In the case before us, XIX consists of three signs, one for the ten, two for the units. The next, CXI, one sign for each hundreds, tens, and units. The next, XCV, two for the tens, one for the units. And the last, XXII, two for the tens and two for the units.

Ranging the signs as below, in their columns of value, the result is easily found, and the Roman had no more difficulty in placing these signs mentally in their proper columns, than we have in casting shillings and pence, even when the figures are not placed in columns:—

	X	IX
C	X	I
	XC	V
	XX	II
(CCXLVII.)	CC	XL VII

A. Stewart Harrison.

Sir,—In answer to inquiry respecting Roman figures, I venture to suggest that they may be dealt with as follows:—

Addition.

	X	IX
C	X	I
	XC	V
	XX	II
	CC	XL VII

Subtraction.

C	X	I
	XX	II
	LXXX	IX

Multiplication.

		X	IX
C		X	I
		X	IX
	C	XC	
M	DCCCC		
MM	C		IX

Division.

	Thou.	Hund.	Tens.	Units.	
XIX)	MM	C	:	IX	(CXI
	XIX				
	CC	:			
	XIX				
	XIX				
	XIX				

XXX.*

Drainage of Westgate-on-Sea. — Mr. Henry Robinson, C.E., has been instructed to prepare a drainage scheme for this rising watering-place.

* We have to acknowledge eleven other letters on the same subject.

THE QUANTITIES QUESTION.

Sir,—To those who have experienced the comfort to the architect on the one hand, and advantage to the client on the other, in the conjoined duties of architect and quantity surveyor, it appears singular there should be any ground for discussion on the question, and it cannot be from any lack of argument that the recent correspondence on this subject should have been left by the profession almost entirely to those who, it may be, through preference or from local usage, decline this combination of duties.

While the disgraceful system of illicit commissions has been very properly protested against by the Institute and other societies throughout the country, the practice of quantity-taking by the architect has been inferentially placed very much in the same position.

The Institute, instead of repudiating this practice, should rather encourage it; if not by making it one of the conditions of membership, at least recognising it as desirable for architects to cultivate.

It appears almost unnecessary to enumerate the advantages the architect possesses by retaining this branch of the profession in his own hands, they lie on the surface. Who, for instance, is more likely to interpret the drawings with accuracy than the author himself? And while an architect has up to the definite point of plan and design done his utmost for a client, why should he decline responsibility for the financial department by delegating this correlative duty to another?

He has to give certificates for payments to the contractors as the work proceeds: how can he efficiently do this if he has to depend on a second party for information?

He has to examine and attest the final accounts: how can he effectually do this but on the basis of a most thorough personal knowledge of the amount of work intended by the drawings and expressed in the schedule of quantities?

The chief and really the only ground of objection to the architect undertaking both duties is a very proper desire to avoid the appearance of collusion with contractors. But why should there be such a morbid feeling in this matter? It suggests anything but a robust, healthy, professional sentiment, and to carry out this theory in other directions we should hardly move hand or foot without being misunderstood.

If a client has the confidence sufficient to justify him in selecting any particular man as his architect, does it less than betoken a lack of self-respect if the architect virtually says, "You must only trust me thus far; I have so delicate a sense of honour that I should prefer you to suspect some other man,—the quantity surveyor, to wit,—even although I preclude myself from doing you full justice"?

There has been also a difference of opinion in recent correspondence on the point,—should the schedule of quantities form part of the contract or not? Surely it should, in justice both to client and builder, otherwise of what use is it?

It determines the dimensions and specific nature of the details of a building, points which the drawings themselves cannot possibly do, and in which, therefore, they are thus so far incomplete and unserviceable to the builder.

The interest of the architect and client alike make it necessary that, so far as it is in the power of skill to do it, the whole intended work shall be fully detailed, so that, on the one hand, the contractor should not be asked to do work without payment which he has not taken into account in his estimate, and, on the other hand, the architect be satisfied that the contractor has done all that was bargained for.

There is another anomaly in connexion with this question, the responsibility which lies on the unfortunate surveyor to reimburse the client for anything he should have included, but has omitted in his calculations. When usage justifies this arrangement, and the surveyor is agreeable to the responsibility, no one has any right to object. All the same, it seems opposed to common sense.

I believe, in conclusion, that were the architect to recognise his duty in this matter, he would be less troubled with the vexatious item of extras, would carry on his work with more facility, and afford greater satisfaction to his client.

And if there are clients,—although I do not believe it,—who think the architect will, in such a case, occupy a suspicious attitude, the architect's sense of duty should be strong enough to carry him through this delicate position.

A few words in reply to Messrs. A. & C. Harston. Their use of the word "loss" is hardly appropriate. In the instance of the surveyor omitting to detail a portion of a building, it can be no source of loss to the proprietor that he should pay for the part omitted; he may have been misled, but he is not a loser in the due sense of the term. Should the surveyor, however, describe work in such a way as to be constructively unsound, it seems natural that he should be responsible for its eventual failure, as that is otherwise direct loss to the proprietor. In fact, it is evidently not just that surveyor or architect, as the case may be, should pay for work which becomes the possession of a third party. Such a course is simply confiscation.

Dundee. Geo. S. Aitken.

*** We have printed this letter that all sides of the question should be before our readers. It should be unnecessary, however, for us to say that we do not take this view of the matter, believing that architects who take out their own quantities run the risk of serious inconveniences, and may place themselves in a false position.

STAINS IN OAK.

"R. W.," or any one else, can readily remove dark stains caused by nails or bolts in old oak by washing the disfigured parts with a solution formed of a pennyworth of oxalic acid to a pint of hot water. It is immaterial whether this is applied hot or cold. If the stains are very deep and strong, repeated applications must be made, and the fluid allowed to soak well in, sundry and often; but ultimately it will assuredly fetch out the ink, for that is what the stain really is. The same mixture is useful for applying to oak that, when worked, goes blue in places,—the result, of course, of not being quite dry. Wash the work lightly with this liquor, and it will bleach the wood so thoroughly as to leave it perfectly clean. Harry Hems.

HUNT *v.* WIMBLEDON LOCAL BOARD.

SIR,—My notice has been drawn to your report of this case in the *Builder* of the week before last (23rd November) and the defendants' solicitor's reply.

Your report of the case is quite correct, and it is quite true, as the defendants' solicitor states, that the plaintiff's one witness was contradicted by three witnesses on the part of the Board; but he does not tell you that the evidence of those three witnesses was so damaged in cross-examination that the jury did not place any reliance upon it, and gave a verdict for the plaintiff, but on argument on the point of law (*i.e.*, the technical plea) Mr. Justice Lindley directed a verdict to be entered for the defendants.

WM. J. FOSTER, Plaintiff's Solicitor.

*** Here the correspondence must end.

CREWKERNE GRAMMAR SCHOOL COMPETITION.

SIR,—In some of your contemporaries, very strong language has been used relative to the conditions of this competition. Probably the writers are unaware of what I know to be a fact—namely, that in the locality round Crewkerne the best building materials are to be found at a very low cost—and that the price of labour, both skilled and unskilled, is from 15 to 20 per cent. less than in the middle and North of England. The Governors must know this, and it is as well that architects should also learn it. I have seen the site for the proposed buildings: there is not a finer one in any town with which I am acquainted.

X. Y. Z.

VARIORUM.

A PAMPHLET on the question of "How to Avoid or Mitigate Famines and Droughts," by S. B. Goslin (Warner & Sons and McCorquodale), is by an engineer who is no novice at water supply or irrigation questions. Mr. Goslin shows that the famine question has received much attention at his hands, and he points out as a remedy the multiplying of wells and tanks, which, from the details given, are easily provided either in India, Australia, Cyprus, or other famine countries. Connected with wells and tanks, machinery of special design for wind and animal power is pointed out. We have so often expressed our belief in the necessity for increased means of irrigation in India that we need scarcely say we consider the matter submitted is well worthy of perusal and consideration.—— The Christmas part of the *Gentleman's Magazine*, titled "The Gentleman's Annual" (Chatto), consists of an interesting story by Mr. Albany de Fonblanque. —— "Arrows of the Bow," the Christmas number of the *Quiver*, is well worth its cost.—— "The Magic Lantern Manual" (Warne & Co.) will tell any one how to make and manage all the varieties of that amusing and instructive instrument.

Christmas and New Year's Cards.

MESSRS. EYRE & SPOTTISWOODE having determined to issue a series of Christmas and New Year's cards of their own, have "gone in" for it in earnest, as they were bound by their reputation to do if they did it at all, and they have sent us such a budget of all sizes, sorts, and shapes as would stock and make brilliant a small shop-window. They are mostly floral, many illuminated; some in packets, such as six crosses with floral emblems; six Christmas greetings in verse and poetical gleanings, with miniatures of the various authors quoted; and dozens of them single. As specimens of design and colour-printing many of them may be alike highly commended. They are mostly designed by Mr. Albert H. Warren, and maintain his reputation in a branch of art to which he has long given sedulous attention.

Miscellanea.

Ventilation.—We have pleasure in directing our readers to a system of ventilation introduced by Mr. J. E. Ellison, of Leeds, by which air may be admitted to the interior of buildings without draught. This is carried out in a simple and effectual manner by allowing the air to enter through cone-shaped openings, which cause it to be quickly radiated and diffused, so that no movement is experienced. Mr. Ellison applies this principle to bricks and skirtings which are made with conical perforations of a neat and ornamental character, suitable for all classes of buildings and any style of architecture. The system commends itself for its simplicity, cheapness, and easy method of application.

Grand Superintendent of Works.—This office in Masonry, left vacant by the death of Mr. Cockerell, has been filled by the appointment of Mr. John Gibson.

The Theatre in Paris. — The French Government does not neglect the arts. A new law, affecting the *régime* of the Opéra, is in preparation, and M. Barboux, Minister of Public Instruction, recently sent a letter to the theatrical managers of Paris, inviting them to communicate their views upon the declension of the dramatic and lyric stage, together with suggestions for improvement. The regulations at present in force were established by an Imperial decree issued in 1864, and the Minister desires to know how, after fourteen years' trial, they can be amended in the interests alike of art, artists, and the public. He wishes to secure for artists a just recompense, for the public a pure and worthy entertainment, and for both dramatic and lyric theatres those "*habitudes de bon ton*" which originally gave them a legitimate reputation. The issue of this comprehensive inquiry will be awaited with interest and the best wishes for its success. "Surely," says the *Telegraph*, "France is the favoured land of art! What would be said in England if a Minister in Downing-street were to complete the National Opera House, ask for a vote of some thousands to carry on her Majesty's, and appoint a commission to devise means of improving our dramatic and lyric stage?"

Portland Cement from Sewage.—The annual general meeting of Scott's Sewage Company was held on Tuesday at Stafford House, the Duke of Sutherland in the chair. The directors, in their fifth annual report, stated that the works at Burnley are now in successful operation, and that an average of about 10 tons of Portland cement of the value of 2*l.* a ton is manufactured weekly. There was a ready sale for it, and the quantity would be increased with additional accommodation for the production of manure. The Blackburn Corporation had erected offices at Finnington, and negotiations were going on at Rochdale. Correspondence was now going on with the Metropolitan Board of Works, the Thames Conservancy Board, and the company, for getting rid of the pollution of the Thames. Sir Henry Cole, in moving the adoption of the report, dwelt upon the success of the works at Burnley. Correspondence was proceeding with 130 places in Lancashire, where, as soon as the law compelled towns to cease from polluting rivers, the plan would probably come into operation.

Improvements near Dublin.—We have received a plan for improving the Killiney Estate, laid out by Mr. Charles Geoghegan, architect, with sketches for villa residences around it. The great object sought, and in which the public are interested, is to form a continuation of the Vica-road from Dalkey, direct through the estate, thereby affording Dalkey and Kingstown a public road on the low level along the coast to Bray. Up to the present time a wall at Sunnyside cuts off all communication between the properties on each side of the same, to the great annoyance and damage of the proprietors outside the boundary, and the owners of which are seeking to get the obstruction removed. This would be a great improvement, and it is to be hoped they will succeed.

Hollow Flooring. — Mr. G. E. Pritchett, F.S.A., has patented a system of "Economic Dry Flooring." It consists in using ordinary agricultural or other pipes laid together over the whole surface to be paved; they should be bedded on a substratum, such as concrete, or other material, so as to form a floor. The pipes when laid level are either cemented or asphalted over, so as to form a pavement or floor. For the pavement of churches, conservatories, or halls, encaustic or any tiles may be bedded on the pipes before alluded to. The invention, it is obvious, may be also applied for ventilating and heating purposes by admission of air, cold or hot, through the pipes.

Sewer Ventilation. Weston-super-Mare. A resolution of the Weston-super-Mare Local Board to adopt the system of open ventilation for the public sewers, as urged upon them for a long time past by the Local Government Board, and recommended by their own committee, is not to pass unchallenged by the ratepayers. A memorial to the Local Board is in course of signature. The object of the memorialists is to induce the Board before they commence the alterations necessary for introducing the "Open System of Sewer Ventilation," to obtain the opinion of an eminent sanitary engineer, of London, as to the expediency, or otherwise, of applying this method of ventilation to Weston.

Soane Museum.—The Royal Academy have named Sir Frederic Leighton, President of the Royal Academy, as additional trustee to succeed the late Sir Francis Grant: and the life trustees have appointed Mr. Alfred Waterhouse, architect, A.R.A., to succeed to the vacancy caused by the death of the late Mr. Frederick Pepys Cockerell, hon. secretary of the Royal Institute of British Architects.

"The Automatic" Steam Engine—Persons looking for a compact economic engine will do well to inquire for themselves into the merits of "the Automatic." It seems to us to deserve attention. Among the advantages claimed for it over other engines, it has no throttle-valve, but is governed direct by a simple patent automatic variable expansion, ensuring great economy of steam and regularity of speed whether the load be on or off. There are no noisy-toothed wheels, and steel and phosphor bronze are used instead of wrought-iron and brass.

Stains for Wood.—We learn that the only medal given for this article at the Paris Exhibition has been awarded to Mr. H. C. Stephens, 171, Aldersgate-street.

TENDERS

For the supply of sanitary pipes for the proposed sewerage works of the Local Board, Ripley, Derby. Mr. R. Argile, jun., engineer. Quantities supplied:—

Gooddy	£898 8 1
Clower	870 0 0
Brooke & Son	850 0 0
Tugby & Co.	815 12 8
Cliff & Sons	810 18 2
Knowles & Co.	804 13 8
Wragg & Sons	784 4 3
Slater (accepted)	639 14 3

For building the warehouses and premises, Nos. 3 and 4, Princes-street, Red Lion-square, Holborn. Mr. J. N. Kingchurch, architect:—

Stimpson & Co.	£4,410 0 0
Wagner	3,740 0 0
Eaton	3,484 0 0
Page	3,393 0 0
Higgs & Hill	3,385 0 0
Howard	3,295 0 0
Crockett	3,000 0 0
Ansell	2,975 0 0
Julien & Co.	2,975 0 0
Downs	2,897 0 0
Reading	2,880 0 0
Battley (accepted)	2,660 0 0
Bowley	2,471 0 0

For the erection of a Board school for 350 boys, master's residence, boundary walls, and fences at Woolston, for the St. Mary Extra School Board. Mr. W. H. Mitchell, architect:—

Stevens & Son	£2,984 0 0
Brinton & Bone	2,890 0 0
Crook	2,879 0 0
Dyer	2,825 0 0
Rowland (accepted)	2,770 0 0

For a villa residence, Dane Park, Ramsgate. Mr. Pite, architect:—

Goodman	£2,112 0 0
Burkitt	2,040 0 0
Shapley	1,975 0 0
Parker & Evans	1,775 0 0
Starke	1,775 0 0
Martin	1,675 0 0

For the erection of a villa residence in Elsworthy-road, Primrose Hill, for Mr. L. Reynolds. Mr. W. Emden, architect. Messrs. J. Lewis & Co., surveyors:—

Patman & Fotheringham	£1,625 0 0
Lea (accepted)	1,430 0 0
Way	1,395 0 0

For the construction of roads and sewers on the High Cross Estate, Tottenham, for Mr. A. Waterer. Mr. H. A. Alexander, surveyor:—

Dunmore	£2,615 0 0
Bloomfield	2,337 0 0
Bell	2,251 0 0
Harris (accepted)	2,120 0 0

For constructing roads and sewers at Bycullah Park Estate, Enfield. Mr. C. R. Brighten, surveyor:—

Batch & Acock (accepted)	£3,100 0 0

For picking up metalling, and rolling part of Southwark Bridge-road, for the Vestry of St. George the Martyr, Southwark. Mr. A. M. Hiscocks, surveyor:—

Turner	£1,420 0 0
Booth & Wheeler	1,396 0 0
Rutty	1,380 0 0
Beevers	1,200 0 0
Batch (accepted)	1,040 0 0

For new premises for the Wilts and Dorset Bank, Bristol. Mr. G. M. Tilley, architect. Quantities supplied:—

Hatherley	£9,647 0 0
Wilkins & Son	8,350 0 0
Church	8,149 0 0
H. Beaven	8,018 0 0
Lang	7,743 0 0
Howell & Son	7,698 0 0
Davis	7,644 0 0
Veals	7,379 0 0
Brock & Bruce	7,189 0 0
Jones & Co.	7,054 0 0
Wilkins & Hill	7,049 0 0
Cowlin & Sons	6,987 0 0
A. J. Beaven	6,980 0 0
Forse & Ashley	6,664 0 0
Stephens & Bastow	6,599 0 0

For shop and residence, Aldershott. Mr. T. Wonnacott, architect. Quantities supplied:—

Cranston	£7,230	0	0
Mesher	6,576	0	0
Hughes	6,471	0	0
Stephens & Bastow	6,434	0	0
Jones & Co.	6,091	0	0
Duke & Fowler	5,500	0	0

For the erection of corn stores, stabling, and other works in Fisherton-street, Salisbury, for Mr. G. J. M. Main. Mr. Fred. Bath, architect. Quantities supplied:—

Hopkins & Son	£1,690	0	0
G. & C. Harris	1,670	0	0
Hale & Sons	1,600	0	0
Young & Sons	1,555	0	0
Cooper	1,525	0	0
Barber	1,510	8	0
Sawkins & Mist	1,483	0	0
Adey	1,477	0	0
A. Harris	1,445	0	0
Kite	1,377	10	0
Tryhorn (accepted)	1,334	0	0

For alterations and additions to the Potter's Arms, Lewisham. Mr. Horace T. Bonner, architect. Quantities supplied:—

Smeaton	£505	0	0
Higgs	397	0	0
Jerrard	397	0	0

TO CORRESPONDENTS.

Blackballing at the Architectural Association (three violent letters on this subject reached us too late for consideration this week. Gentlemen who "call names" should, at any rate, affix their own names). L. D. C.—C.—J. S. G.—R. A.—J. G.—J. M.—W. H. C.—A. D. D.—R. N.—A. A.—R. B.—L. P.—G. S.—R. A.—R. T.—F. J.—C. E. H.—W. G. C.—W. H. M.—F. B.—S. H.—J. H. C.—C. E. F.—W. G.—G. F. W.—A. B.—B. & Co.—H. T. P.—T. H. H. C.—S. K.—M. H.—M. de F.—M. M.—H. A.—P. & Son.—H. R.—W. A.—H. C. S.—J. B.—J. M'D.—D. & Sons.—J. P. B.—S. & P.—H. S. (not received).—T. W. (somewhat late).—W. H. F. (yes).—An Engineer (next week).—W. P. (next week).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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PURSUANT to an Order of the High Court of Justice, Chancery Division, made in the matter of the Estate of JOHN EVANS, deceased, and in an action, Harries *v.* Evans, 1878. E. 101.

The Creditors of the said JOHN EVANS, late of Kilgerran, in the County of Pembroke, Architect (who died in or about the month of April, 1877), are, on or before the 13th of JANUARY, 1879, to send by post, prepaid, to Mr. IVOR EVANS, of Cardigan, in the County of Cardigan, the Solicitor of the Defendant, the Administrator with Will annexed of the deceased, their Christian and Surnames, Addresses and Descriptions, the full particulars of their Claims, a Statement of their Accounts and the nature of the Securities (if any) held by them, or in default thereof they will be peremptorily excluded from the benefit of the said Order.

Every Creditor holding any Security is to produce the same before the Vice-Chancellor, Sir Richard Malins, at his Chambers, situated No. 3, Stone-buildings, Lincoln's-inn, Middlesex, on MONDAY, the 20th day of JANUARY, 1879, at TWELVE o'clock at Noon, being the time appointed for adjudicating on the Claims.

Dated this 28th day of November, 1878.

ALFRED RAWLINSON, Chief Clerk.
C. E. ABBOTT, 52, Lincoln's-inn-fields, Agent for
A. J. EVANS, of Cardigan, Plaintiff's Solicitor.

PURSUANT to a Judgment of the High Court of Justice (Chancery Division), made in the matter of the Estate of WILLIAM BARRITT, deceased, and in an action Wilde *v.* Barritt, 1878. B. 492.

The Creditors of WILLIAM BARRITT, late of the Borough of Kingston-upon-Hull, Builder and Contractor, who died in or about the month of August, 1878, are, on or before the 15th day of JANUARY, 1879, to send by post prepaid to Mr. CHARLES JAMES TODD, of the Borough of Kingston upon-Hull, the Solicitor of the Defendants, the Executors of the deceased, their Christian and Surnames, Addresses and Descriptions, the full particulars of their Claims, a Statement of their Accounts, and the nature of the Securities (if any) held by them, or in default thereof they will be peremptorily excluded from the benefit of the said Judgment.

Every Creditor holding any Security is to produce the same before the Vice-Chancellor, Sir Richard Malins, at his Chambers, 3, Stone-buildings, Lincoln's Inn, in the County of Middlesex, on the 24th day of JANUARY, 1879, at TWELVE of the clock at Noon, being the time appointed for adjudicating on the Claims.

Dated this 3rd day of December, 1878.

ALFRED RAWLINSON, Chief Clerk.
COLLYER-BRISTOW, WITHERS, & RUSSELL,
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Plans, drawings, and designs, expeditiously prepared from rough sketches. Terms moderate.
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PARTNER, with 3,500*l.*, WANTED, to take a Half Share in an old-established Steam Saw-mill, Building Material, and Coal Business, doing 12 000*l.* per annum.—For particulars, apply to Mr. O. SHELLARD, Auctioneer and Estate Agent, Hereford.

PARTNERSHIP.—An Architect with a small practice, wishes to enter an office with a view to Partnership, or to meet with an ENGAGEMENT for about three days or so per week.—W. W. care of Messrs. Rixon & Arnold, Stationers, Poultry, E.C.

PARTNERSHIP.—To ARCHITECTS.— Advertiser having had sixteen years' experience in some of the first offices, desires a JUNIOR PARTNERSHIP, or ENGAGEMENT, with view to same. Fullest references as to ability in design and connexions.—Address, ARCHITECT, Starkey, Bookseller, &c. Oxford-street, Reading.

PARTNERSHIP. — An ARCHITECT wishes to PURCHASE a SHARE in a good PRACTICE in the Midland or Southern Counties of England. Has great ability in the artistic branches of the profession. Can etch and colour. Aged 25. Excellent references from an A.R.I.B.A.—X. Y. Z. 12, Belvoir-street, Leicester.

ASSISTANT (competent) WANTED, in a District Surveyor's Office, near London. He must be thoroughly conversant with the Building Acts, and the construction and repair of roads and footways. Salary 3*l.* weekly.—Address, with copies of testimonials, to Box No. 183, Office of "The Builder."

ASSISTANT (thoroughly experienced) WANTED, in a provincial Office. Must be a good draughtsman, well up in general design and construction, and able to take out quantities with accuracy. Age not under 25.—Apply, J. D. 86, Micklegate, York.

CLERK WANTED, for New Station Buildings in South Wales. One conversant with the building trade, a good bookkeeper, correspondent, and able to trace drawings. A good character for honesty, sobriety, and industry indispensable. Security will be required.—Apply, giving full particulars as to capabilities, age, if married or single, references, and salary expected, to CHARLES CLARIDGE, Contractor, Banbury.

MERCHANT'S CLERK.—Wanted, in the South of England, a CLERK, who understands the working of a Brickyard, to generally Superintend the same, and keep the accounts, also the accounts of Stone Quarries. He would be preferred if capable of tracing and colouring.—Address, stating age, experience, references, and salary required, to J. C. 1, Purbeck-place, Millbank, Westminster.

TRAVELLER WANTED, with knowledge of parquet flooring, and possessing good connexion amongst Architects and Builders. Only energetic and competent men need apply.—State age, references, and salary required, Box 188, Office of "The Builder."

MANAGING FOREMAN of PAINTERS and DECORATORS.—WANTED, by a London Builder and Contractor, a first-class man of ability and business habits in the above capacity, for a permanency, if suitable.—Apply, stating age, salary required, and references to present or last employers, to Box No. 187, Office of "The Builder."

GENERAL FOREMAN.—WANTED, the SERVICES of a thoroughly practical and efficient Man as GENERAL FOREMAN, to Superintend the Erection of New Station Buildings in South Wales. A joiner by trade preferred. Must be perfectly sober and energetic, accustomed to manage men, and well up in all branches of the trade. Character will have to bear investigation. Preference given for one having had experience on similar works. State age, qualifications, if married or single, late employers, and wages required, to CHARLES CLARIDGE, Contractor, Banbury.

MACHINIST.—WORKING FOREMAN required to Take Charge of Woodworking Machinery in a large Building Firm.—Reply, stating experience and salary expected.—D. & C. 245, High Holborn.

WALKING FOREMAN WANTED, by a London Firm. Must be active and energetic, thoroughly acquainted with the trade (new work and alterations), competent to take dimensions, set out all descriptions of work, and prepare working drawings. One who has filled a similar situation preferred.
State age, salary, and references to Box 189, Office of "The Builder."

FOREMAN. — WANTED, a thoroughly practical and energetic Man, to Superintend Drainage and Sanitary Works.—Apply to W. & E. C. 42, Curzon-street, Mayfair.

SHOP FOREMAN of JOINERS (good) WANTED for a small Builder's Shop.—Address, stating terms, &c. to Box 194, Office of "The Builder."

GENERAL FOREMAN.—WANTED, by a London Contractor, a first-class Man accustomed to large contracts, who can produce good work at a fair price.—Address, stating age, trade, salary required, also references to present or last employers, to Box 195, Office of "The Builder."

STREET FOREMAN.—Wanted, an active Man as above. One used to paving and sewerage works preferred.—Apply stating age, references, and salary required, to Box No. 185, Office of "The Builder."

CARPENTERS and JOINERS.—Wanted, at once, Two or Three good Workmen.—Apply to C. F. KEARLEY, Builder and Contractor, Uxbridge.

HOT-WATER, Gasfitter, and Bellhanger. WANTED, by a London Builder and Contractor, a first-class Man, in his Fitters' shop.—Address, stating wages required, age, and references to last or present employer, to Box 186, Office of "The Builder."

BRICKMAKERS. — Permanent Employment given to Men who will let themselves by the season, to prepare earth, and make bricks with Bowden's machines. None but experienced sober hands need apply.—Apply J. PEERLESS, Eastbourne.

BALLAST BURNERS WANTED, to Dig and Burn at per yard, finding fuel. To measure the excavations. Three years' constant work for good men.—Address, in first instance, CONTRACTOR, at Horncastle's Central Advertisement Offices, 61, Cheapside, E.C.

APPRENTICE to the Wood-carving WANTED, premium indispensable.—Apply to R. A. BRANGAN, 54, Foley-street, Langham-street, W.

OFFICE BOY WANTED by an Architect. Must write a good hand. Age about 14.—Address, Box 180, Office of "The Builder."

LAD (sharp, active) WANTED, in Builder's Office, and attend to Yard.—Address in own handwriting, and salary required, to A. B. 149, Lancaster-road, Notting-hill.

TO SURVEYORS.
Notice is hereby given that the County Roads Board for the County of Glamorgan will, at a Meeting to be held at the Town-hall, Neath, on TUESDAY, the 18th day of FEBRUARY, 1879, at 12.30 p.m. proceed to the appointment of a HEAD SURVEYOR of County Roads in the said county, at a yearly salary of 400*l.* and an allowance of 80*l.* for travelling expenses.
Candidates are requested to send testimonials, addressed to "The County Roads Board," under cover, to me, on or before the 1st day of JANUARY, 1879.
The names and residences of two sureties in the sum of 500*l.* for the due discharge of the duties of the Office, must be sent with the testimonials, or they will not be attended to.
The Surveyor must reside in the County of Glamorgan, and devote his whole time to the duties of the Office.
EXTRACTS FROM GENERAL RULES.
"If any Surveyor appointed by the County Roads Board shall misconduct himself, he may be dismissed at the next meeting of the Board, but if from any other cause the Board shall desire his removal, or the Surveyor shall be desirous of resigning Office, three calendar months' notice in writing shall be given by either party."
Every Surveyor appointed by the Board shall enter into an agreement to give such notice should he desire to leave, or in default thereof shall be liable to pay the Board a sum equal to three months' salary, to be recovered as ascertained damages.
THOS. MASTERS DALTON,
Clerk to the County Roads Board, Glamorgan.
Cardiff, 20th November, 1878.

TO QUANTITY SURVEYORS, Builders' Clerks, and Others.—WANTED, immediately, in an Architect's Office, a Person thoroughly competent to take out quantities, measure work, and make up builders' accounts.—Apply, by letter only, stating age, qualifications, and salary, to MARTIN & CHAMBERLAIN, Architects, 53, Ann-street, Birmingham.

WOOD-CARVING.—WANTED, a good FIGURE CARVER.—Apply to R. A. BRANGAN, 54, Foley-street, Langham-street, W.

FRET LEAD GLAZIERS (good) Wanted, by CAMM, BROTHERS,
Smethwick, near Birmingham.

SURVEYOR, Correct Leveller, neat and expeditious DRAUGHTSMAN, wants a RE-ENGAGEMENT. Town surveys, drainage, &c.—F. F. 2, Gunton-place, Peckham-rye, S.E.

QUANTITY SURVEYOR and Measurer, thirty years' experience, offers his SERVICES in taking off and preparing bills, quantities, measuring up and pricing works (well up in prices and prime costs), adjusting disputed accounts, estimating, &c. Moderate terms as agreed.—SURVEYOR, No. 11, Florence-road, New Cross, S.E.

DRAUGHTSMAN (Architect's or Contractor's) DISENGAGED. Used to general office duties, &c. several years with London architects, two years with a contractor. Aged 27. Good plain draughtsman. Country not objected to.—S. T. No. 30, Warwick-street, New-cross, S.E.

ARCHITECTURAL DRAUGHTSMAN wants a SITUATION, after New Year. Working, competition, detail drawings, &c. Good references. Terms moderate. Aged 22.—P. V. Villa St. George, Newcastle-on-Tyne.

MANAGING ASSISTANT (Architect's), with first-class references, and City and provincial experience, desires a RE-ENGAGEMENT.—B. H. 74, High-street, Clapham, S.W.

ASSISTANT (Architectural) disengaged after Christmas. Neat, quick, and accurate draughtsman, working drawings, details, and specifications, and general office work. References. London preferred.—M. A. care of Sewell & Crowther, No. 161, Strand, W.C.

ASSISTANT (Architectural), first-class General, DISENGAGED after Christmas. Fourteen years' experience; six years in present office. Capable of managing in absence of principal.—ARCHITECT, 6, Claylands-road, Clapham-road.

ASSISTANT wants RE-ENGAGEMENT. Neat draughtsman (Architect's, Engineer's, and Surveyor's). Used to works, quantities, surveys, sections. Salary very moderate.—Box 196, Office of "The Builder."

ASSISTANT (Architect's) desires an ENGAGEMENT in Town. Eight years' experience. Good draughtsman. Terms moderate. References.—Box 184, Office of "The Builder."

ASSISTANT (Architect's) requires RE-ENGAGEMENT. Can prepare working drawings, details, &c. Also knowledge of surveying. Aged 21. Salary 30*s.* per week.—Box 190, Office of "The Builder."

ASSISTANT (Architect and Surveyor's) is open to an ENGAGEMENT after Christmas. First-class draughtsman, designer, and colourist.—H. B. 15, Victoria-place, Eastbourne, Sussex.

ASSISTANT (Quantity Surveyor's) wishes for a RE-ENGAGEMENT. Well up in abstracting, billing, measuring, and the general routine of the office.—Address Box 191, Office of "The Builder."

ASSISTANT (Land Surveyor's and Engineer's), desires an ENGAGEMENT. Four years' experience. Aged 22. Salary moderate.—F. J. S. 5, St. Thomas-street, Ryde.

ASSISTANT.—An ENGAGEMENT required with a Contractor or Architect. Eight years' experience in the building trade, partly in London and the provinces, as Confidential Assistant, both in the office and on the works. Good draughtsman. Understands detail, specifications, quantities, estimating, levelling, and general routine. Highest references.—G. C. 1, No. 283, Cambridge-road, London, E.

ASSISTANT (Surveyor's or Builder's), well acquainted with office duties, quantities, measuring up, and estimating, extra accounts, drawings, &c. wants a RE-ENGAGEMENT.—E. M. 23, Arlington-street, New North-road, N.

ASSISTANT (Land Surveyor's, &c.) requires an ENGAGEMENT. Competent in laying down plans to scale, measuring, surveying, developing building estates, taking dilapidations, &c. Highest references and testimonials.—Box 193, Office of "The Builder."

SURVEYOR'S ASSISTANT, rapid Leveller, good Draughtsman, experienced in architecture, wants EMPLOYMENT.—J. NEAVE, 214, Euston-road, N.W.

JUNIOR ASSISTANT seeks an Engagement in an Architect's Office. Drawings made from rough sketches and details. Quick at tracing. Good references.—Box 101, Office of "The Builder."

JUNIOR ASSISTANT (Surveyor's, Builder's, &c.), aged 20, wishes to meet with an APPOINTMENT. Is well up in figures and building office routine. Five years with last employers. Good reference.—B. C. 164, King's-road, Chelsea.

JUNIOR ASSISTANT or otherwise. RE-ENGAGEMENT WANTED. Design, colouring, working drawings, details, and specifications. Eight years' experience. Excellent references. Salary moderate.—Box 181, Office of "The Builder."

CLERK (Builder and Decorator's) desires an ENGAGEMENT. Aged 22. Good references. Salary moderate.—P. C. 14, Ufton-grove, Southgate-road, N.

QUANTITY and ESTIMATING CLERK, of great experience, well up in specifications, &c. is open to an ENGAGEMENT. Present terms very moderate.—J. E. ORMES, 6, St. Mary's-road, Hornsey, N.

BUILDER'S CLERK seeks an Engagement. Eighteen years' experience. Married. Town or country. G. G. 93, High-street, Croydon.

BUILDER'S CLERK wants a SITUATION. Good bookkeeper, experienced in prime-cost, estimating, &c.—CLERK, 2, Aldine-street, Shepherd's-bush, W.

BUILDER'S CLERK (experienced) wants EMPLOYMENT from five to ten in the evening. Moderate salary.—Apply, N. A. 302, Upper-street, N.

CLERK requires an Engagement. Has been principally used to prime cost, and assisting in office work generally. Aged 30. Good reference.—A. 61, Cambridge-street, Pimlico, S.W.

CLERK or TIMEKEEPER requires a RE-ENGAGEMENT. Well up in prime-cost and general office duties. Eighteen years' experience. Good references.—A. B. 44, Waterford-road, Moor Park-road, Fulham.

MANAGING CLERK (Builder's and Builders' Merchant's).—A Gentleman, of experience in the Building, &c. trade, who is thoroughly acquainted with the routine of office work, desires an ENGAGEMENT as above, or other position of trust.—Y. Z. 22, Derby-road, Southport.

CLERK of WORKS or General Foreman. Long experience, and good references.—H. L. 4, Trevor-square, Brompton, S.W.

CLERK of WORKS, or FOREMAN of WORKS, seeks RE-ENGAGEMENT. Open the first week in January. Reference. Eight years' experience in similar capacity.—H. E. T. 67, St. James's-road, Southsea.

CLERK of WORKS or GENERAL FOREMAN wants a RE-ENGAGEMENT. Thoroughly practical and experienced in details and construction and all branches. Town or country. References.—A. B. 18, Newgate-street, E.C.

CLERK of WORKS (Town Reference), Architect or Surveyor's Assistant, or Builder's Clerk, seeks an ENGAGEMENT. Perspectives, scale and working drawings. Fourteen years' experience.—J. C. T. 2, Circus-street, Marylebone-road.

CLERK of WORKS, or FOREMAN of a JOB, wants an ENGAGEMENT. Experienced in all branches of the building trade. Good references and testimonials.—C. H. G. Mr. Wagland's, Peascod-street, Windsor.

CLERK of WORKS, just completing a large job, wants a RE-ENGAGEMENT. Practical and experienced. Well up in measuring work, &c. Mason by Trade.—CLERK of WORKS, S. P. Co. Sharpness Docks, Gloucester.

CLERK of WORKS wants a RE-ENGAGEMENT. Thoroughly practical and experienced. Well up in making details and working drawings, &c. Good references.—W. 9, Thorney-street, Bloomsbury, W.C.

CLERK of WORKS wants RE-ENGAGEMENT. Accustomed to extensive works, and the management of an estate. Thoroughly practical and energetic. Twenty years' experience. Carpenter and joiner. Good references and testimonials.—A. B. care of Messrs. Deely & Co 53, Great Portland-stre

CLERK of WORKS wants a Re-Engagement. Town or country. Has had great experience in all classes of buildings and the building trades with London architects. References to late employers.—H. JAMES, Crescent Post-office, Notting-hill, W.

CLERK of WORKS wants a Re-Engagement. Joiner by trade. Aged 36. Well up in measuring. Good draughtsman. Good references from Architects and Engineers —T. D. 12, Poplar-walk-road, Brixton, S.W.

CLERK of WORKS, thoroughly practical in all Branches, wishes to FILL UP part of his TIME in SUPERTENDING various WORKS for Architects or Private Gentlemen who wish to Construct their own Buildings. Plans and specifications prepared. First-class references. Small salary.—Box 177, Office of "The Builder."

MANAGER (Estate Agents and Owner's), or GENERAL FOREMAN. Well up in house repairs and decorations, can measure up work, and prepare specifications. Just leaving similar situation.—T. M. 8, Courtnell-street, Bayswater, W

GENERAL FOREMAN wants a RE-ENGAGEMENT. Town or country. Bricklayer by trade. Aged 34 Good references.—H. H. 29, Arlington-street, New North-road, Islington.

GENERAL or WORKING FOREMAN wants a SITUATION, by a good practical Bricklayer. Good manager of men. Good references. Twenty-five years' experience.—R. W. 146, Mayall-road, Herne-hill, S.E.

GENERAL FOREMAN, or Foreman of Carpenters and Joiners, wants a RE-ENGAGEMENT. Competent, energetic, and reliable. Aged 40. Six years' reference from one of the largest firms.—E. T. 3, Ball-court, E.C.

GENERAL FOREMAN seeks a RE-ENGAGEMENT as SHOP or JOB FOREMAN. Well up in buying timber, and all branches. Carpenter and joiner. (39.) References.—W. K. 51, Oakley-crescent, King's-road, Chelsea, S.W.

GENERAL FOREMAN or ASSISTANT. Thoroughly understands draining, levelling, roadmaking, accounts, and managing a body of men. Has good knowledge of plotting and land surveying. Six years in last situation on a nobleman's estate. Aged 21. Substantial testimonial and reference.—RUFUS, Florence Cottage, Exeter-street, Kentish Town, N.W.

FOREMAN (Painter and Decorator's). — RE-ENGAGEMENT required by an energetic Man, possessing a thorough practical knowledge of best-class plain and decorative work Accustomed to the management of a large number of men. Aged 37. Town or country. Good London references.—A. C., Bailey's, 25, Wilton-road, Pimlico, S.W.

FOREMAN (Brickmaker and Contractor's) wants a SITUATION, to superintend the manufactory of kiln and clamp bricks, tiles, and other ware usually made in sale-yards. Would take work by contract if preferred. Good references.—J. ALCOCK, Chipstead Brickworks, Sevenoaks.

WORKING FOREMAN (Carpenter) seeks a JOB. Has a fair knowledge of all branches. Would be found a useful and confidential man to a small builder. Good reference.—W. E. 41, Copenhagen-street, Caledonian-road, N.

INSPECTOR, Clerk of Works, or Foreman wants RE-ENGAGEMENT. Experienced in all kinds of building and construction.—ALPHA, 71, Summer-street, Sheffield.

JOINER'S WORK WANTED, by a thoroughly practical man, in any quantity. Labour only.—A. B. No. 17, Norland-road, Notting-hill, W.

STAIRS and HANDRAILS.—WANTED, by a first-class Staircase Hand, a JOB by the piece. Labour only. W. B 29, Portland-street, Oxford-street, Soho, W.

DECORATIVE ARTIST wants EMPLOYMENT. Very quick at stencil-cutting. No objection to short job.—H. H. care of Mr. Oxford, 13, Grove-cottages, Chelsea.

DECORATOR wants RE-ENGAGEMENT. Well up in drawing. Good colourist. Used to antique and modern lettering. Has had management of good jobs. First-class reference.—Box 182, Office of "The Builder."

GRAINER and DECORATOR, just served his time, wishes EMPLOYMENT. Would fill up his time in other branches. Good scholar.—W. J. 43, Camera-square, Chelsea.

GRAINER, MARBLER, and GILDER, practical and energetic, with good experience, wants a RE-ENGAGEMENT, or JOB. Is a good painter and practical foreman.—P. P. 5, Princes-street, Stamford-street, Blackfriars.

GRAINING, MARBLING, GILDING, and STENCILLING done for the trade at low prices.—The Advertiser, with assistants, is prepared to take large or small Job. Town or country. Accustomed to good work. Will contract for builders' paintings.—For references and patterns, address Box 192, Office of "The Builder."

BUILDERS.—SITUATION WANTED, by a young Man, who has served his time at the Cabinet trade. Is good at polishing and paperhanging.—Address, W. M., Richards & Son, Witham, Essex.

GENERAL FITTER. — A Middle-aged Man wants a SITUATION to Attend to a Stationary Engine. Can do repairs. Good references.—CLOUD, 73, Wellington-road, Holloway.

PIECE-WORK WANTED by a first-class London Plumber. Town or country. Labour and solder only. Good references. — A. PEARCE, 178, Malden-road, Haverstock-hill, N.W.

PLUMBER (good), new work or jobbing, wants a JOB or Constancy. Reference.—S. W. 18A, Temple-street, St. George's-road, Southwark.

PLUMBER, or good Three-branch Hand, wants a SITUATION. Well up in gasfitting.—G. L. 11, Upper Park-place, Dorset-square.

PLUMBER (good) well up in jobbing, wants a JOB or Constancy. Can do plain zinc-work. Fill up time painting or glazing. Wages moderate.—J. G. 16, Munster-square, Regent's Park.

PLUMBER (good) wants a JOB. Fill up time fitting and zinc working. Take charge of work. Would not object to piece-work. References. Aged 28.—PLUMBER, No. 58, Lumley Buildings, Pimlico-road, S.W.

PLUMBER and FITTER. Well up in bath and closet work. Aged 37. Good references. Constancy preferred.—G. Plumber, 93, Euston-road, Euston-road, N.W.

PLUMBER (Jobbing) wants a SITUATION. Willing to turn his hand to plain zincworking and gasfitting, and to fill up time with painting.—C, J. 26, Luard-street, Caledonian-road, King's-cross.

PLUMBING and ZINC-WORKING WANTED, by a practical Man, Piecework only, finding solder if necessary.—J. WILLIAMS, No. 20, Bluit-street, East-street, Walworth.

THREE-BRANCH HAND.—Well up in Jobbing Work, &c.—B. 39, Bloomsbury-street, New Oxford-street, W.

LABOURER (Plumber, Gasfitter, and Painter's). Good, and very handy. Reference. Low wages.—E. P. 44, Mansion House-street, Hammersmith, W.

PLASTERING (Piecework) WANTED, by a practical Man. Well experienced in taking plastering to any amount. Town or country. Labour only. Country job just completed.—T. WILLIAMS, Post-office, Litchurch, near Derby.

MACHINIST, of many years' experience in Sawing and all kinds of wood-cutting Machinery, wants a RE-ENGAGEMENT. Joiner by trade. References.—J. C. 40, Canonbury-square, N.

APPRENTICE (Joiner and Cabinet-maker's).—The Parents of a respectable Youth are desirous of APPRENTICING him (Indoor) to the above trade.—Address, stating premium required, to H. E. H. 245, Evelyn-street, Deptford, S.E.

IMPROVER (Builder and Decorator's).—WANTED to Place a Youth, aged 16, with a Builder and Decorator, in order that he may learn Painting and Decorating, and obtain an insight into the other branches of the trade. A premium of 50*l* would be paid.—Address, Mrs. HEAD, 7, Upper Baker-street.

GLAZED TERRA-COTTA (Lipscombe's Patent).—The Great Improvement; cleaned by every shower of rain beating against it. Beautiful colour and texture imperishable, extremely hard, moulded to any design, moderate price.
Specimens at LIPSCOMBE & CO.'S Charcoal Filter Office, No. 44, Queen Victoria-street, E.C. (removing from Temple-bar.

GEORGE SKEY & CO. (Limited).
TERRA COTTA and ARCHITECTURAL POTTERY.
London Office, 42, BERNERS STREET, W.
Cornices, String Courses, Consoles, Mullions, Jambs, Tracery, Panels, Terminals, Capitals, Vases, Pedestals, &c.
Terra-cotta is impervious to weather and the impure atmosphere of large towns, and it has been shown by careful experiments that it will bear nearly double the thrusting stress of Portland stone

PLANT (Brickmaker's).—The PLANT of a BRICKMAKER, giving up the Business, TO BE DISPOSED OF, consisting of a Nearly New Bawden's Brickmaking Machine, Pug-mill, Barrows, Wheeling-plates, &c. &c.—May be seen and particulars had of T. W. COWAN, Horsham.

TO IRONFOUNDERS, BUILDERS, and CONTRACTORS.
TO BE SOLD, by Private Treaty, separately, or in One Lot, the STOCK-IN-TRADE, PLANT, MACHINERY, UTENSILS, and GOODWILL of the Business lately carried on by Messrs. Day & Molineux, at Syren-street and Burlington-street, Liverpool.
The Stock, &c. in Syren-street includes portable engine on iron wheels, mortar-mill, one single and one double-gear crab winches, Dobbin and other carts, wheelbarrows, joiners' benches, planks, timber, and sundries.
The Plant, &c. in Burlington-street includes one 6½-inch cylinder vertical engine, one upright boiler, 7 feet by 3 feet in diameter; two screw-cutting lathes, one boring-machine, fitter's bench, with vices and sundries.
For further particulars, apply to Messrs. HARMOOD BANNER & SON, Accountants, 24, North John-street, Liverpool.

GRAVEL and BUILDING SAND (good), a large quantity FOR SALE at Hampstead, near Christ Church.—Apply, by letter only, to A. E. STACY, Sittingbourne, Kent.

FREE SHOOT.
EARTH and DRY RUBBISH may be SHOT at Claxton-grove shoot, Margravine-road, near Greyhound-road, about half a mile from West Kensington station and Hammersmith Broadway.

CONTRACTS *continued from page ii.*

COUNTY of DURHAM.
TO BUILDERS AND CONTRACTORS.
The Magistrates of the county of Durham are desirous of receiving TENDERS for the ERECTION of a Central POLICE STATION at Durham.
Plans and specifications may be seen and perused at the Office of WILLIAM CROZIER, Esquire, M.I.C.E., Engineer and Architect for the county of Durham, at the Assize Courts, Durham, on and after the 10th day of DECEMBER instant, and Tenders are to be sent to him, endorsed "Tender for Central Police Station, Durham," not later than the 24th day of DECEMBER instant.
Forms of Tender (in which only sole Tenders will be received) may be had as above, and copies of the quantities for the whole of the works may be also obtained on a deposit being made of Two Guineas, which will be returned on receipt of a bonâ fide Tender for the Works.
By order,
RALPH PARK PHILLIPSON, Clerk of the Peace.
Durham, December 2, 1878.

FOUR ACRES of FREEHOLD BUILDING LAND, all Frontage, at Wimbledon, TO BE SOLD in One or Several Plots, or would be Let on Building Leases. Frontage about 1,000 feet. Roads and Sewers made, gas and water laid, and lamps fixed.
Apply to Messrs. PATERSON, KERR, & CO. Land Agents and Auctioneers, Albion Chambers, Moorgate, E.C.

RAMSGATE.—To BUILDERS and CAPITALISTS.—Eligible SITES for VILLA RESIDENCES, with good aspects on the newly-opened Dane Park Estate, situated between the Granville Hotel and the South-Eastern Station.
PEPPERCORN RENT to JANUARY, 1880.
For plans and particulars apply to
Mr. ALFRED R PITE, Architect,
Bloomsbury-square, W.C. and Ettingham House, Ramsgate.

BUILDING LAND TO BE LET on long Lease near Chalk Farm Station. — A very desirable PLOT of LAND, containing about 23,500 superficial feet, suitable for a Pianoforte factory, warehouse, or other large business. Also other Plots, suitable for villas or terrace-houses.—For particulars, apply to Mr. THOS. WELBOURNE, 8, Bernard-street, Regent's Park-road.

BUILDING LAND, BROMLEY, KENT.
TO BE SOLD, a compact FREEHOLD ESTATE of about Six Acres, near to the station, in a fine position, with extensive frontage ripe for building. Will be sold a bargain to an immediate purchaser.
Apply to Messrs. BAXTER, PAYNE, & LEPPER, Town-hall, Bromley, Kent, and 157, Fenchurch-street, E.C. (4061 D.)

BAYSWATER.—BUILDING SITE, suitable for stables and coach-house, TO BE LET, on Building Lease.—For plans and particulars, apply to Messrs. TRESS & INNES, Architects, 27, Queen-street, City; or to Messrs. BUCKLAND & CO. No. 20, Queen's-road, Bayswater.

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For plans and particulars, and for printed forms of Tender, apply to the Hospital's Surveyor, Mr. HENRY S. LEGG, Surveyor's Office, Christ's Hospital, Newgate-street, E.C.
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